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EDITORIAL

NEW ORLEANS A MEDICAL CENTER.

The press reports of several millions donated to the University of Chicago for the development of its medical school presents large interest for those concerned in medical education.

A few years ago the Harvard Medical School was changed from a mediocre teaching institution to probably the best school in this country by a gift which permitted the erection of monumental buildings together with all complementary equipment. A civic interest in Boston added the control of the excellent hospitals and with these co-ordinates Harvard moved into the first place in medical education. Certain insular methods of

curriculum have still prevailed, but a liberal administration is gradually broadening the educational usefulness of a school which at all times has led in scientific achievement.

With Chicago, New York, Philadelphia, conditions have not been entirely likewise. Here the several schools have enjoyed state or municipal support, with more or less added endowment. Where the schools have been part of universities the assurance of maintenance has always been the reason for good standards. No one of the schools in these places, however, has been able to make eccentric standards, through a financial independence of a student body. With Cornell alone a liberal endowment has permitted some restrictions.

Johns Hopkins University in its Medical School has been singularly fortunate in being selected for a varied philanthropy which has practically assured the future of a school always exceptional in its methods of teaching and so far singular in many of its curricular arrangements.

Washington University in St. Louis has not yet assumed the promised stride which was to put it on a basis like that of Hopkins, even though several million dollars of endowment have been afforded and the generous are still adding to the store.

Chicago has more than once taken the initiative in medical education and its real medical schools have more than once suffered in the sacrifices committed for better standards. That the University of Chicago, with less than the Harvard endowment, proposes the best medical school in the country is quite becoming to Chicago and it is to be hoped that a city of such large achievements generally may help the endowment enough to make this ambition a realization.

The policies which govern philanthropic bodies possessed of wealth for public service are usually not open to the intelligence of the man in the street, but it would seem that so far the tendency is to strengthen those already strong—perhaps those weak or less strong may find help later.

There have been three medical centers in the United States for nearly a century—Philadelphia, New York and New Orleans. Other places have developed as educational centers and, among other university activities, medical education has grown into larger and larger importance. State universities, like those

of California, Minnesota, Wisconsin, have satisfied these claims of the public and are giving of the best. Accidental wealth of endowment or large state support by themselves create opportunities and none of these make a medical center.

The large material for medical investigation and research in the principal seaports of any country makes for their educational value and if the clinical opportunities are made available the field for student and for the practical physician must be always great.

New Orleans has these facilities—true not in magnificent buildings or in the number of them, but in the population which comes from all countries and which in its natives represents an almost tropical people. Even with limited means, in its local medical school, one large achievement after another has come forth, and in a purely scientific way New Orleans has never lost that original prestige, established the first half of the last century. With the support of wealth both in their respective states and cities, as well as from private sources, the medical schools of the North, East and West are already satisfying dreams of successful administration without care for the economies of a parsimonious budget and the future opens up a more advanced attitude to the growing problems of medical education. Our own citizens have given, but a medical school to-day demands a great deal to be efficient and it requires the highest degree of efficiency to properly train the physician of to-day.

New Orleans is almost awake to its commercial greatness; every day a new clarion note is sounded in one or another enterprise. The medical field has always done its work well, without the clarion note, and thus far it has largely thriven upon the empty laurels of its achievement, still hoping for a more practical reward, expressed in such terms as those which have cheered the University of Chicago—"8,000,000 for the Medical School of the University of Chicago!"

ORIGINAL ARTICLES

(No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editors on the tenth day of the month preceding that in which they are expected to appear. Reprints may be had at reasonable rates if a WRITTEN order for the same accompany the paper.)

A DIGEST OF THE INSECT TRANSMISSION OF DISEASE IN THE ORIENT WITH ESPECIAL REFERENCE TO THE EXPERIMENTAL CONVEYANCE OF TRYPANOSOMA EVANSI.

By M. BRUIN MITZMAIN, M. Sc.,

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In a discussion of the interpretation of the mode of conveyance of infectious diseases by insects, the question is limited, from the viewpoint of the entomologist, to the consideration primarily of the armament of the insect carrier. The nature of the insect's appendages gives us at once a working hypothesis for the founding of our experimental procedure. From the character of the mouth parts, e. g., whether of the piercing type or the mandibulate, we know at once if an insect carrier can function as an active parasite or purely as a passive one.

The latter mode of conveyance involves, as we at once recognize, such forms as the scavenger flies with fouled mouth parts, feet pads, and body hairs, affording unlimited possibilities of contamination. This type of disease transference cannot be dismissed from the jurisdiction of a discussion of this sort, but it must be related with an insect which assumes a passive role in the sense of playing the part of an accidental carrier. This can be interpreted from results of experiments referred to later.

Modes of conveyance with insect vectors involve the mechanical, whereby the agent acts as a mere porter, and the biological, whereby the agent acts as the definite host. In the latter, a definite cycle of development occurs within the body of the insect and the causative protozoan parasite is modified prior to assuming a form suitable for conveyance through the channel of the insect's biting apparatus. Transmission of this type involves,

as we are well aware, such classical diseases as malaria and sleeping sickness.

The formulation of a working hypothesis is the first step in laboratory research, and the philosophical basis for a proposed line of action is invariably reasoning by analogy. The experimental investigation of the insect transmission of the surra trypanosome is no exception, and ever since the monumental work of Kleine and of Bruce in the etiology and mode of conveyance of African trypanosomiases, the investigators of surra have been summoned from time to time to demonstrate a similar biological phenomenon of the cyclical development of the trypanosome in the insect carrier. The results of the investigations of workers in India, Java and the Federated Malay States do not tend to support this hypothesis. On the contrary, circumstantial evidence, judged from field observations, at least, is strongly opposed to it and a satisfactory explanation of the spread of the infection of surra among draft animals in the Orient is provided in the direct method of insect transmission.

This was the status of the experimental evidence concerning the epidemiology of surra prior to the time of the writer's modest attempts to contribute to our knowledge of the subject. It was clearly seen at the outset that the work of all previous investigators failed in one important essential, namely, the lack of biological appreciation of the pathogenetic material presented.

Briefly the defection consisted in this: Since it was attempted to prove that the direct method of transmission was the only one, the conclusions drawn were unwarranted, as all of the experimental evidence contributed showed, first—that the investigators employed only wild flies caught in the open, which failed to accurately account for the possibility of a previous infection, as the food source was not ascertainable; and, secondly, the principle of a biological cycle of development of the surra trypanosome could not be properly eliminated because the flies used in all the experiments lived only a few days after biting the infected host.

With due deference to the monumental advances inaugurated by medical men in applied entomology, it is only fair to explain that the workers in the Orient were not entomologists, but were medical men who lacked either training or appreciation of

the biological factors involved in the problems of trypanosomiasis. It was obvious that, in order to pursue the work accurately, it was essential to provide a rational biological equipment. In other words, in order to incriminate or eliminate certain blood-sucking flies, it was necessary to apply in our experiments only laboratory-bred insects, which must be used in large numbers and during long periods. At first, attempts were made to experiment with every species of ectoparasite found in sufficient numbers to warrant investigation. Difficulties were at once encountered in breeding certain species in large numbers and also in keeping flies alive for considerable periods. The forms bred successfully included the carabao louse, cattle tick, stable fly, gad fly, the hippoboscid fly, and several species of mosquitoes. All of these were successfully kept under artificial conditions for daily feeding tests during considerable periods following the initial meal on the infected host. The flies which gave trouble in their breeding and longevity were the sand fly, a species of gnat, and the horn fly.

If conclusions are warranted, the evidence obtained would indicate that all the species applied could transfer infection readily if considerable abrasions were present, that is purely mechanical contamination. Also only one species, namely, *Tabanus striatus*, the gadfly or horse fly, could transmit the disease readily through puncturing of the unbroken skin of the experimental animal. In all, four hundred experiments were attempted before any thought was given to speculate on the results obtained. The stable fly, *Stomoxys calcitrans*, was accurately eliminated relative to a developmental cycle after ninety-four days of continuous daily feeding, and was considered not a serious factor in the dissemination of the disease by the direct method of application. It was concluded, also, that the horse fly, *Tabanus striatus*, was the most formidable and probably the only agent in the disease transmission from host to host by virtue of its skin-piercing apparatus. The latter fly is now accepted as a surra-conveying fly of the Philippines.

Let us consider how far this parasite is active as an agent of transmission. The limits of time infection were determined after an exhaustive period of feeding tests. It was ascertained that under natural conditions this horse fly, either voluntarily

or on account of strenuous resistance on the part of the host attacked, will invariably interrupt itself while sucking blood and requires several distinct insertions of its proboscis before a point of satiation is reached. These pricking stabs of the insect's mouth can be induced in an experiment to the extent of twenty-six times or a matter of fifty-two bites when applied at short intervals to two hosts alternately. The epidemiological significance of this peculiar biting action appeals to one at once. It would appear, at first impression, that a fly given the necessary materials for operating, namely, sick host and healthy host, transmission would result infallibly. And if many healthy contacts were present an epizootic would appear to be not preventable.

The query naturally arises—how many animals could flies infect successively? A question of highest importance, where large numbers of animals are quartered, as obtains in army posts and public corrals. This point was settled, experimentally, with the following results: Horse flies permitted to bite a highly-infected horse when successively applied in individual tubes to three healthy animals, at intervals, aggregating five minutes, could infect the first horse exposed to the fly bites, but could not infect the second and third horses employed. The trypanosomes were deposited on the first animal only, being washed cleanly into the blood stream of this contact and did not adhere to the lumen of the fly's proboscis nor were they retained by the salivary glands and regurgitated upon subsequent feedings.

In the matter of the time limit of infection it was found that flies of this species could transmit at intervals of a few seconds only, within three minutes, five minutes, seven and one-half minutes, ten minutes and in fifteen minutes, but could not transmit trypanosomes at various intervals from twenty minutes to twenty-six days after soiling their proboscides with blood of a virulent case of surra. Monkeys, Guinea pigs, horses and cattle were successfully inoculated by the flies used in this series of experiments.

As to the fate of the trypanosomes within the body of the insect host, it was determined by systematic dissections that horse flies harbored the organisms in an unchanged form for a period

of thirty hours and were present in a form virulent by inoculation into susceptible animals a period of ten hours after the infective bite. The organisms became probably rapidly disintegrated through the alimentary tract, for it was ascertained that trypanosomes similar to the blood forms were found in the fecal deposits of infected flies beginning two and one-half hours after feeding.

Transmission of infection hereditarily was eliminated both experimentally in numerous trials and practically when judged by field observations.

Preventive measures were promoted in the following recommendations: Through attack of the fly in the larval form by chemically treating sand along lake shores found harboring them; protection of animals in darkened sheds which which was found to repel flies; and avoiding bites in enzootic areas by keeping animals in the open only during the hours between 7 p. m. and 5 a. m., the time when this species of *Tabanus* is inactive.

The possibility of surra dissemination through the agency of non-biting flies was determined in an investigation of *Musca domestica*, the house fly. The possibility of infection conveyed by the house fly in a passive role has long been recognized. In reference to trypanosome transmission it is presupposed that the method is correlated with a previous skin abrasion affording the channel of entrance for the pathogenic organisms. Consideration of skin abrasions occurring through injury or disease must include the mechanical openings effected by various ectoparasites. The latter include such forms as the ticks, gad flies and stable flies. These parasites are important factors commensurate to the size of the openings punctured in the host's cuticle and which remain after withdrawing the piercing mouth parts in satisfying the desire for blood. It is obvious that in the presence of muscids, with mouths constructed for lapping contaminated products, unlimited possibilities for conveyance of surra from host to host present themselves.

In the present study the investigation was pursued from various angles. The purely mechanical method of contamination was not considered until the more important biological relations were exhausted. Only *Stomoxys calcitrans* was considered as a correlative factor in reference to the house fly as

a carrier of infection. In a previous report, I have described the intimate relations existing in the feeding habits of the two species of flies. It was pointed out that the coprophagous flies, and especially the house fly, acted in a sense as secondary passive parasites by lapping to a point of engorgement the blood brought to the host's epidermis by the probing of the proboscis of the stable fly. It was observed under natural conditions that an unusual percentage of non-biting flies were attracted to domestic animals not alone to act their role as scavengers but were found to accompany stable flies and gad flies to avail themselves of the food provided thrugh the wounds made by the latter.

With this peculiar phase of parasitism in mind experiments were conducted to determine the relationship of *Musca domestica* as a carrier of trypanosomes. It was aimed to prove, first, that this fly could harbor infective organisms and was determined satisfactorily by numerous dissections and injections of saline suspensions of abdominal contents of flies fed on the abraded tail of the surra-infected monkey. Two Guinea pigs and one monkey inoculated with material of this sort sickened after an average incubation period and died, giving indications of the nature of the disease at autopsy. Preparations of the blood of the three animals showed *Trypanosoma evansi* in large numbers.

Attempts were made to simulate the normal relationship of parasitism in *Musca domestica* and *Stomoxys calcitrans* by placing many flies of the two species in a common bottle and permitting them to attack the enclosed tail of a surra-infected monkey. Only laboratory-bred flies were employed.

The five experiments were followed by negative results, demonstrating under these conditions that *Musca domestica* does not transport infection through the channel afforded by the wound caused by the skin-piercing apparatus of *Stomoxys calcitrans.*

The possibility of surra infection being carried by the fly's feet was tested also. This was performed in the same manner with both species, as in the preceding, but with this difference: The infected *Muscæ* were introduced from a separate bottle and by careful manipulation of the wire support attached to the monkey's tail the flies were permitted to alight on the appendage, but were prevented from feeding.

The five experiments failed to demonstrate that the wound

made by the labium of the stable fly was a suitable channel for the introduction of trypanosomes carried on the pulvilli of *Musca domestica.*

Finally, to serve as controls to these experiments, four tests were made to decide the question of the possibility of the punctures caused by the bite of the stable fly serving as sites for the introduction of trypanosomes in virulent blood. The four Guinea pigs used for the fly biting and the subsequent rubbing in of blood conveyed on a platinum loop escaped infection.

The practical significance of the conveyance of trypanosomes obtained by *Musca domestica* from the bite of the probing of the stable fly when wounds are present was finally investigated. Monkeys and horses were employed in this series. The house flies, after apparent engorgement of blood derived from the probes of stable flies were transferred to clean bottles and the abraded surface of the monkey's tail presented for the completion of the meal. The two horses exposed were scarified by scratching the haunch with a sharp scalpel.

In transferring bottles and tubes applied to the infected host the mouth of the vessel was carefully wiped with a cloth saturated with strong alcohol. A few minutes were permitted to elapse before the vessel was then applied to the broken skin of the healthy host. Four of the five experiments attempted resulted in positive transmission.

In confirmation of conclusions to be inferred from the experimental evidence obtained, epidemiological studies were conductd in the region of two very well-defined outbreaks of surra in two provinces on the Island of Luzon. In one focus, a total of one hundred and five saddle horses and pack horses contracted the disease at a time when the presence of the blood-sucking form, *Tabanus striatus,* could be definitely excluded. It could be shown, however, that the first horses, which died before the malady was identified, became infected at a time when gad flies were prevalent. It was observed here that at the height of the spread of the disease an unusual infestation of house flies occurred. This was easily accounted for by the presence of large quantities of sugar cane debris accumulating about the stables where the animals were quartered on this sugar hacienda. Here myriads of flies were attracted and were found breeding. Nearly

95 per cent of the sick animals were found with open sores arising from packs and saddles and many were seen with mouth abrasions due to the rough sugar cane fodder upon which they fed.

The second outbreak investigated gave strong evidence of infection due exclusively to the gad fly, *Tabanus striatus*. Twenty-four cases of the disease were isolated from brood mares located on the government stock farm near Manila. The evidence incriminating horse flies of the species *Tabanus striatus* was presented as follows: *Tabanus striatus* was the predominant species of fly observed preceding and during the outbreak. Not a single instance of infection arose in animals kept stabled during this period. Only pastured animals were attacked and these were kept in stables at night so that mosquitoes and other nocturnal forms present could be eliminated. Experimental horses kept in these pastures at night and stabled during the entire day escaped infection. Not a single instance of wound infection could be demonstrated among these animals, which were daily in the care of a government veterinarian. The infection exacted its toll from animals segregated in four nearly distinct pastures with wooded barriers, conditions favoring the peculiar habits of flight and rest for the horse flies incriminated.

In the matter of eliminating the factor of a biological transmission of *Trypanosoma evansi* all of the epidemiological evidence tended strongly to be convincing. Studies of this nature were conducted during three years and more throughout the Philippine archipelago with a definite conclusion that every outbreak of surra infection could be satisfactorily accounted for in the direct method of transmission.

In the outbreak last analyzed this principle was given a convincing test in the following ways:

Large numbers of horses, experimental and others, were exposed to fly bites from one week to sixty days following the isolation of the last case of surra. These animals were kept in the identical pastures and woods from which sick animals were removed.

More than five thousand horse flies were collected from this region at intervals following the outbreak. These were ex-

amined beginning forty-eight hours after possible contamination and this was continued for a period of three and one-half months. These findings, in addition to the biting experiments on healthy monkeys and horses, were negative.

A previous outbreak upon the government stock farm occurred in September, 1909; in the presence of similar faunal conditions there was no recurrence of the disease until four years later, May-June, 1913. This also would tend to eliminate the possibility of any biological development relative to protozoan parasite and insect carrier.

OBSERVATIONS ON TETANUS WITH REPORT OF A SUCCESSFULLY TREATED CASE.*

By L. SEXTON, M. D., New Orleans.

Tetanus is an acute infection, caused by the tetanus bacillus of Nicolier (1884) and Kitasato (1889), usually following some wound or abrasion. Tetanus is characterized by tonic and clonic spasms of the voluntary muscles. While it is usual for some traumatism to precede the attack, it is not always possible to discover such wound or abrasion, but it should be remembered that the infection may take place within the alimentary canal (being abraded) or from some subcutaneous injury becoming infected through the blood (rarely), or from an undiscovered wound. Tetanus has at times been almost epidemic in certain hospital wards and in portions of the tropics, supposed to be due to the action of the warm climate and manure mixed in the stable and garden soil, favorable to the development of the virulent tetanus organism.

The bacillus is anaerobic, a facultative saphrophyte, capable of continuing its development outside the body tissue. It is an almost constant part of the soil of the garden, stable and dairy pens, and it is on this account that laborers, negroes, stable and dairy attendants are the most often attacked by the disease. It should also be remembered that such laborers are least careful about keeping trivial wounds aseptic, and the hygienic surroundings as well as habits of such people are generally bad. The

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reason they suffer from tetanus more often than other people is explained by the fact that the tetanus bacillus is normally found in the dung of cattle and other warm-blooded animals, hence their liability to infection through contact.

Before asepsis was thoroughly understood the death rate in poorer white and colored families was very large, during the first two weeks of infant life, from so-called "nine-day fits." The cord in many cases was severed by the midwife's rusty septic scissors, tied with a dirty thread, wrapped with an uncleanly rag, and often greased with non-sterile applications. Hebrew surgeons say that the death rate from trismus was more frequent than it should be before the rabbis were taught to be more aseptic with the *Mohel,* and after treatment of circumscision with asceptic dressings. It is our personal opinion that all such operations in the interest of child conservation should be done by doctors and dressed by nurses who have been thoroughly drilled in aseptic surgery. Many cases of tetanus have been produced in the present great European war by explosives and the contact with stable and garden soil in the trenches of Belgium, France and Galicia, especially in the highly-cultivated districts of these countries, where the soil is intimately mixed with manure, which is used for fertilization. Early experimenters found that if garden mold or soil was placed in an abrasion or under the skin of an animal, tetanus would follow.

Kitasato in his studies could not isolate the germ until he heated the pus to 80 degrees Centigrade for one hour to get rid of the other septic microbes, as tetanus is nearly always a mixed infection. The tetanus, like the anthrax bacillus, is very resistant to heat. The tetanus bacillus develops in the wound in long, delicate threads, breaking up into separate bacilli with spores at one end, resembling the head of a pin. It is next to impossible to recover the tetanus bacillus from the original wound of infection, though the cerebro-spinal fluid taken from the patient and injected into an animal will readily produce the characteristic tetanus convulsion. The tetanus bacillus always remains in and around the original wound, while its toxalbumins are absorbed into the system through the motor nerve tracts, so it is a pure toxemia, not a germ, traveling along the motor nerve tracts. Tetanus bacilli are independent of oxygen,

of low vitality, and only invade bruised or septic tissue. They grow better in hydrogen. As the germs develop in the septic wound toxic bodies are produced, going direct to the spinal cord and brain, resulting in the tonic spasms which are characteristic of the disease. The toxemia is said to be four hundred times more poisonous than strychnin, to which it is similar in action.

Diagnosis: Tetanus could hardly be mistaken for any physiological sickness other than strychnin poisoning, from which it is differentiated by the history of the poison having been taken or to the evidence of a wound infected; by the relaxation between the strychnin spasms and the ability to open the mouth. The hands are more involved in the strychnin poisoning, the thumbs turning in; the muscles of the jaw and back are more involved in tetanus. The fever and violent sweating stages are absent with strychnin and are very pronounced in tetanus.

Prevention: There is no doubt about the fact that prevention of tetanus by proper disinfection of all wounds and immunizing doses of antitetanic serum is far better and safer than the treatment of the cases after they have been allowed to develop. Tetanus cases have been reduced by 75 per cent in the United States since the doctors and the public have been educated to a saner Fourth of July and Christmas and the necessity of proper disinfecting and sterilizing of all wounds as soon as received. Anders' mortality was 74 per cent in acute and only 8 per cent in chronic cases lasting over fifteen days. With a 60 to 80 per cent death rate from tetanus in European wars, the Fourth of July, with its toy pistols and cannon crackers, makes the present an opportune time to discuss the prevention and treatment of tetanus. All punctured and lacerated wounds should be relieved of all foreign bodies by instruments or by pouring into them a warm 50 per cent solution of hydrogen peroxid in order to remove by oxidation the deeper and smaller particles driven into the tissue. Equal parts of tincture of iodin and alcohol are more suitable to these wounds than are the antiseptic dusting powders, which do not so thoroughly penetrate the wound. The application of a 20 per cent phenol solution, followed immediately by alcohol to neutralize it, is an almost sure way of destroying

the bacillus. All lacerated wounds should be thoroughly cleansed, drained, packed and allowed to heal by granulation. Out of sixty thousand wounds in Bavaria, .6 per cent died, .4 per cent of these died of tetanus (in the present war) regardless of the prophylactic injection of serum; hence the necessity of using all other legitimate preventive measures, including Bier's method of hyperemia for the prevention of tetanus in all wounds. The mistake is in giving just one dose of anti-tetanic serum and stopping, when it should usually be repeated within from seven to ten days in order to make assurance doubly sure. Large doses of the anti-tetanic serum, with heroic measures to control the nervous excitability, should begin with the first stiffening of the jaws in a suspected case.

Prognosis is becoming better as we learn more about the prevention and treatment of tetanus and by reducing the chance of the absorption of the toxins. The later development of the disease the fewer the spasms, the more chronic the course the better chance for recovery. When incubation is under ten days the mortality usually reaches 60 per cent. When it is over ten days and the course of the disease runs three weeks, it is denominated chronic tetanus and the mortality is from 20 to 40 per cent. If the period of incubation and the course of the disease are both three weeks in duration 50 per cent may recover. The death rate in the present European war has been very large from tetanus because of the great number of lacerated wounds and because the war has been waged in the highly-cultivated fields and garden districts of those countries, notwithstanding that the free use of anti-tetanic serum and antiseptic first aid dressings were used immediately after injury. So at present in Europe it is one of the most serious diseases with which the surgeon has to contend.

Lacerated and punctured wounds, in which foreign bodies have been driven, furnish the best medium for the development of tetanus. Gunshot wounds, compound fractures and the puerperal state are also favorable to the development of tetanus. Where there is any suspicion that tetanus may follow we should give the anti-tetanic serum as a precaution in all such cases. Occasionally hospital wards and neighborhoods seem to be infected; the contagion is spread by actual contact, as in dressing.

instruments, nurses and doctors, who are not aseptic. The suspected wound should be disinfected not once, but twice daily, for it must be remembered that the germs remain in and about the wound where it was first received and that it is only the toxemia which is generated several days after the wound is made that is absorbed. There are no symptoms of tetanus manifested until the toxemia has reached the spinal cord, through the medium of the motor nerve tracts. Irritation of these motor tracts cause the tonic convulsins to begin. Muscle cramps and girdle pains are due to the irritation of the sensory nerves. The extensor muscles always overcome the flexors, hence the head is retracted, feet extended and the back is arched (opisthotonus). Tonic spasms are continuous except when relaxed by heroic doses of sedative drugs, which have to be kept up throughout the attack. The spinal cord is in such a state of excitability that any noise, draught, or jarring causes painful spasms to occur. Asphyxia may be threatened by tonic convulsions of the chest and throat muscles. Often even the inexperienced surgeon is taken off of his guard as to the seriousness of the attack on account of the clear mind to the end of even a fatal termination.

Other prominent symptoms of tetanus are retention of the urine and constipated bowels, rigid muscles, including the abdominal ones, with no sleep without heavy drugging. The first symptoms of tetanus are difficulty in mastication, spasms of the jaw, with rigid neck and abdominal muscles. When the face muscles are involved, a sardonic grin is produced that is peculiar to the disease. The violent muscular contraction with the absorption of the toxins produces a violent fever and sweating, which is usually a constant symptom to the end of the case. The patients usually suffer a great deal from girdle pains produced by spasms of the diaphragm.

Treatment: Removal of all foreign bodies, cleansing opening and draining of all wounds has been a daily occurrence at our clinic for the past ten years. The result has been fewer cases of tetanus to treat from the clinic in the great Charity Hospital of New Orleans, though many more wounds have been treated in that decade than in previous years. The germs develop their toxins in the wound before they are absorbed

into the system, hence the risk of infection is much less when the wound is kept sterile.

We should endeavor to keep the bowels well open and the kidneys active in order to eliminate as much of the poison as possible. The irritability of the spinal cord should be controlled by large alternating doses of sedative medicines, including chloroform, to control these spasms. We prevent the toxins entering into the system by thorough disinfection of the original wound. We inject two thousand units of anti-tetanic serum in the vicinity of the wound or between the wound and the spinal cord. If the wound is upon the hand, use the serum in the arm near the brachial plexus. If in the foot, use it near the sciatic nerve. Ashurst and Johns prefer chloroform to ether in order to relax the spasms, as it is more easily administered, but it is five times more lethal in its effects. Blake of New York recommends twenty minims of a 20 per cent solution of sulphate of magnesium to be injected into the spinal cord to relax these spasms. Eighteen cases so treated resulted in four recoveries; two were acute and two chronic, showing a death rate of 70 per cent, which was about the same mortality as when treated by other methods. Irons recommends from three to five thousand units of anti-tetanic serum intraspinously and ten to twenty thousand units intravenously in his treatment of tetanus as soon as the case is diagnosed. The earlier the treatment is begun the more favorable the prognosis of the case. After these heroic doses, on the fourth day he again uses ten thousand units subcutaneously. We think the alternating use of syrup of choral, bromid of potash, morphin and atropin should be the way in which sedatives shuld be given to control the convulsions of tetanus. Daumsler of the French army used six grams of choral every six hours until the spasms were relaxed (rather heroic, it would seem). Wintraud says that little can be expected from the serum treatment, that its use is in prevention and not in cure of the disease. Sainton cured six patients out of twenty-two by injecting forty cc of a 2 per cent phenol solution twice daily subcutaneusly. It has been found that phenol is less toxic by injection than by the stomach. Johns and Ashurst depress the functions of the spinal cord by from thirty to sixty grains of chloretone given in either oil or whiskey.

You may expect retention of urine, which is very common on account of the spasm of the cut-off muscle.

Intraspinal injection of fifteen hundred units of anti-tetanic serum is the best and quickest way to apply the remedy to the over-excited spinal cord. The same amount of spinal fluid should be allowed to escape before the injection of the anti-tetanic serum is begun.

In nourishing a case of tetanus rectal or nasal feeding may become necessary when it is impossible to get the food into the mouth on account of the spasms of the jaws; a tooth may be extracted to facilitate the introduction of nourishment.

> Mrs. C., age thirty-five, mother of two children, who had never had any serious sickness before, was attacked by all the classical symptoms of tetanus and was so diagnosed. The only abrasion that could be found upon her person was an ulcerated hemorrhoid, from which she had suffered for the past three weeks with impacted spells. The jaws closing, tonic and clonic spasms increased daily, as did the temperature, when it became necessary on the fourth day to control the spasms by chloroform and sedatives in large and increasing doses. We darkened the room with curtains and removed the patient to the most quiet and best ventilated room in the house. We restricted all visitors and drafts and noises as nearly as possible. Although we pushed the sedatives to the limit the patient would be attacked by spasms as soon as the doses were reduced or given further apart. In the early period of the disease we obtained eight vials of fifteen hundred units each of anti-tetanic serum, which we administered in the flank, two each day, until they were all used. We discussed the use of the serum intraspinously and into the arachnoid space, but on the principle of "safety first" for the patient we injected into the flank and deltoid, which we commend to others in serious cases which at least subject the doctor to less criticism if the case should prove fatal, as they often do. We nourished the patient on milk, broths, soups, and various liquid foods (swallowed best when under the influence of sedatives). We kept the bowels open with purgatives or enemas, used milk instead of water to quench the thirst, as it served the purpose of nourishment at the same time. When the temperature would reach one hundred and three or four degrees, she was given one five-grain dose of phenacetin or acetanilid compound, not to be repeated more than twice in twenty-four hours, provided the temperature again reached one hundred and four degrees.

As to whether this patient was benefited by the injection of the anti-tetanic serum as a cure, or whether the antiseptic treatment of the hemorrhoidal ulcer and unloading the impaction, or the alternating use of the sedatives, nourishing food, keeping the bowels open, or whether nature cured the case in spite of our efforts, I leave to the Society to judge.

DISCUSSION ON DR. SEXTON'S PAPER ON TETANUS.

Dr. F. Temple Brown: In May, 1916, a boy three years of age was brought to my clinic at the Charity Hospital with an infection of the leg just above the ankle, of seven days' duration. The jaws were rigid and he could not open his mouth more than half an inch. We incised the wound and cauterized it and dressed it with wet saturated solution of boric acid and gave 1,500 units of antitetanic serum at once and sent him to the hospital. About three hours later we anesthetized and gave 3750 units instrapinally, 5250 intravenously and 3,000 in site of injury. There was a marked reaction, temperature 104° and numerous convulsions, which were controlled by chloral and bromid. On the third day, 3750 units were given intraspinally. The child was discharged cured 27 days after admission, which cure I think was entirely due to the antitoxin and the way it was given.

Dr. H. B. Gessner: In reviewing the records of the Charity Hospital for the past ten years, I found two cases in which there was no apparent site of entry of the infection. Dr. Parham read a paper on this subject some several years ago. Dr. Sexton aptly brought out the point that the cerebro-spinal fluid of infected animals is poisonous to other animals. I have been impressed by the poor results that tissue examinations have shown. I believe that practical and popular articles on tetanus should be written with the idea of educating the public. The best results in three hundred and two cases were had with chloretone. I think there can be no doubt that the antitoxin must be given in very large doses before and during the incubation period.

Dr. Sexton (in closing): The incubation period seems to range from two days to one month, with and average of nine days. I think in the matter of prevention that the value of the local disinfection treatment is underestimated. I believe that the anti-tetanic serum injection should be made somewhat close to the site of infection, as the toxins travel along the motor nerves. I think that the antitoxin to be of marked effect should be given in large and repeated doses and previous to the seventh day of incubation. 1,500 units is not enough. Where sedatives are necessary, I think they should be alternated, and in doses large enough to control the convulsion.

UNILATERAL EDEMA.*

By S. CHAILLE JAMISON, M. D., New Orleans.

It is the intention of this article to discuss only those conditions in which edema is constantly limited to one side of the body, or part thereof. We eliminate at once the two greatest causes of edema, i. e., the heart and kidneys, as edema due to disease of these organs is bilateral. Edema due to local infections is mentioned only for the sake of completeness.

In unilateral edema two factors are to be considered: Mechanical obstruction to the return of fluid from the part and increased permeability of the vessel walls due to loss of vasomotor tone.

Edema Involving an Entire Lateral Half of the Body.

This condition exists only in association with hemiplegia, and is due to a general loss of tone in the blood vessels supplying the paralyzed half of the body. It is by no means always present, and it would seem that the perverted function of the tissues themselves would contribute, because of their inability to give fluid in the normal manner. Such edema is usually transitory, and disappears as atrophy sets in.

Edema of One Arm.

Three conditions are to be considered: 1. Pressure within the thorax. 2. Obstruction to the lymphatics. 3. Phlebitis.

There is, perhaps, no one sign that points so surely to a thoracic aneurism or new growth as edema of one arm. It must be borne in mind, however, that a dilated auricle may cause sufficient pressure on one of the innominate or sub-clavian veins to produce edema. I have also seen a case where it was proven at autopsy that the edema of the arm was due to the pressure of an enormous amount of fluid in the pleura.

Edema of one arm due to obstruction to the lymphatics is best seen in carcinoma of the breast. It is too common to need more than passing mention.

Thrombosis of the axillary or brachial veins may occur, but is exceedingly rare, and is usually associated with valvular disease. Phlebitis of these veins is also a rarity, and will be dis-

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cussed more fully further on in connection with phlebitis of the femoral vein.

Edema of a Lateral Half of the Thorax.

This is not an usual condition, but is frequently not commented upon. It occurs, however, practically in every case where there is a large amount of fluid in the pleura, and is due to pressure upon the azygos and internal mammary veins, into which empty respectively the posterior and anterior intercostal veins. The majority of text-books on physical diagnosis tell us that the bulging of the intercostal spaces in fluid in the pleura is due to the actual distention of the cavity of the thorax from the fluid; this, of course, does play the larger part, but the edema certainly plays some part in the production of this physical sign, as anyone who has been observant and has "tapped" the chest for large quantities of fluid can testify.

Edema of one Leg.

There are two conditions to be considered: (a) Obstruction to the veins. (b) Obstruction to the lymphatics.

Obstruction to the veins is due to (1) thrombosis, (2) phlebitis, and (3) pressure of a tumor within the pelvis.

Thrombosis and phlebitis usually go together, and cannot be separated clinically, except that the absence of fever, leukocytosis and local tenderness, together with a cardiac lesion, would point to thrombosis; while an infection such as typhoid or a septic uterus points to phlebitis and an infected thrombus. Cabot* states that

> Phlebitis, almost invariably unilateral, may be unaccompanied by pain or tenderness, but, as a rule, there is soreness over the course of the vein on the inner side of the thigh. The diagnosis can sometimes be made only by the study of the associated disease; for instance, typhoid fever or the puerperal state.

Obsruction of the veins due to the pressure of a pelvic tumor can be dismissed without comment.

Obstruction to the lymphatics.—This usually occurs from an infection and destruction or sclerosis of the internal iliac glands, which drain the lymphatics from the lower two-thirds of the

*Cabot—Diff. Diagnosis. Vol. 2, p. 465.

uterus, the upper two-thirds of the vagina, the bladder, the seminal vesicles and vas deferens, the prostate, the upper portion of the urethra, and also the deep lymphatics from the upper and inner portion of the thigh. I have had two cases in my service this summer, both of whom have presented massive edema of one leg. Autopsy showed no thrombosis or phlebitis, but both showed chronic infection of the genital organs, with enormous enlargement of the internal iliac glands, and of the lymphatics of the leg leading to them. The same condition occurred in a woman who died of carcinoma of the uterus; the glands, of course, being obstructed and destroyed by metastases instead of infection.

It has been long known that elephantiasis from filarial disease is due to the obstruction of the lymphatics by the adult worm. I examined the blood of over 100 negro patients for the filarial embryos, but was unable to demonstrate a single case; these examinations were made at night, between 12 o'clock and daylight. I am far from satisfied, however, that there is no filarial infection among humans here, for the great prevalence of this disease in dogs (though, of course, it is not the same type of filaria) would lead one to suppose conditions are favorable for this disease.

In conclusion, I can say from my own limited experience, that edema of one leg is certainly a common condition in this locality, while, so far as I can find, edema of one arm is rather rare. I believe, also, that edema of the arm is usually easily explained, while edema of one leg is not. It appears to me that edema of one leg is perhaps more frequent from obstruction to the lymphatics following infection of the genitals than from any other cause.

BLOOD TRANSFUSION SIMPLIFIED; DEDUCTIONS FROM NINETEEN CASES, ELEVEN HUMAN AND EIGHT ON THE DOG.*

By JAMES T. NIX, JR., B. S., M. D.,

Adjunct Professor of Surgery, N. O. Post Graduate School of Medicine.

The virtue and potency of the transfusion of blood is no longer a matter of conjecture but a well-established fact. In hemorrhage of any variety blood is the best substitute for blood. In sepsis of any type a fresh supply of healthy phagocytes is the best possible reinforcement and often tips the scale to the side of recovery. In hemophilia, anemia and many other blood disorders, transfusion is extremely valuable. Yet, in spite of this undisputed knowledge, we are astonished to find at the great Charity Hospital of New Orleans scarcely a half-dozen blood transfusions, dating from its very beginning to the present time. Two of these were for hemorrhage, 20 c.c. being transfused by the direct method with the aid of Kimpton Brown tubes. Two were for hemophilia, 40 and 20 c.c., respectively, being transfused by the indirect syringe method, citrate of soda being used as an anti-coagulant. One was for comatose malaria, 250 c.c. being administered by Kimpton Brown tubes. The malarial case was moribund at the time; all the other cases did well.

There were two transfusions at the Hotel Dieu of the city prior to the introduction of the apparaus included in this article. Both were by the direct method according to the technic of Crile, artery to vein anastamosis. In these two septic cases tne patients had gone down too far to rally and the technic not given a fair trial. I was unable to obtain the records of the other institutions. This brief survey represents the meagre role played heretofore by so important a therapeutic measure.

Probably the reason for this scarcity of transfusions was because the direct method of undiluted blood was used in nearly all instances and the operation made harder than it should be.

According to statements from numerous sources which were later verified by experimentation a 2 per cent solution of sodium citrate, one dram to one ounce of blood, was found to be the best anti-coagulant, the blood remaining unchanged

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for six to eight hours. The same dilution with one-fourth of 1 per cent citrate coagulated in one and one-half minutes. The same dilution with one-half of 1 per cent citrate coagulated in three minutes. The same dilution with 1 per cent of citrate coagulated in twenty minutes. The same dilution with 2 per cent of citrate coagulated in six to 8 hours. A 2 per cent solution, dilution one dram to two ounces, coagulated in fifteen minutes.

Of the numerous methods of transfusion suggested to-day, the one which at first appeared to be the simplest and best was that which appeared in the May number of the *Southern Medical Journal* by A. O. Singleton of Galveston, Tex., He made use of Kimpton Brown tubes, paraffin coated, and by means of wash bottles half-filled with water established positive or negative pressure, during injection into recipient or aspiration from donor respectively. The first five human transfusions were by this method, 500 c. c. of blood being transfused in each case. The first two were on the same patient, splenic anemia, at one week's interval, the blood count being raised from 1,200,000 to 2,500,000 by the first, and the second raised the count to 3,7000,000. The patient's general condition improved wonderfully and the spleen was removed June 6, 1916. She has continued to improve and at present is in better condition than she has been for two years. In one instance the donor was a son and in the other a daughter, preliminary agglutination tests were negative.

The next two were administered to a boy eighteen years old, suffering from a virulent type of bacteremia with infectious poly-arthritis, following a suppurative mastoiditis. Vaccin and other therapy had failed, the patient was running a temperature of 101 to 103 degrees and rapidly losing ground. By the first transfusion 500 c.c. of blood were taken from an elder brother. Temperature immediately subsided and never went above 100 degrees, so a second transfusion was given seven days later, at which time the same amount of blood was again taken, but from a younger brother. Within one week fever left entirely and patient was out of danger.

The fifth case by the paraffin-coated tube was a case of puerperal septicemia of one month's duration, the temperature being

septic and high. Five hundred c.c. of blood were transfused from a younger sister and the patient made a rapid recovery. In all five of these cases the results were most gratifying, though the technic of pressure bottles with paraffin-coated tubes and citrate solution was complex, cumbersome, and required too many assistants.

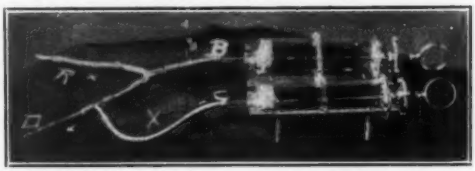
The insertion of tip of tube into the vein at times was very difficult, especially when the tube was filled with blood, so it was decided to make separate special tips by drawing out small size drinking tubes, by heating in the flame of an alcohol lamp. The tips were so made that there was a small swell near the small end of the tube over which the vein could be drawn and safely tied. To the other end was attached a small piece of rubber tubing. These tips could be easily inserted, filled with citrate, the rubber connection clamped with a non-serrated artery forceps, and the tip allowed to remain inserted as long as necessary.

These special tips, which can be made in the space of a few minutes, represent to my mind a factor of utmost importance in the simplification of blood transfusion, because of the fact that they will connect to almost any type or style of syringe or transfusion tube. Once the tip is inserted into the vessel it is not taken out until the operation is complete, there being no danger of coagulation in the tube if it is kept filled with citrate after each step in the transfusion.

The sixth and seventh cases were septic and 500 c.c. of blood was transfused in each instance. One patient was moribund at the time and died twenty-four hours after the transfusion; the other immediately responded to treatment and made a good recovery. The Kimpton-Brown tube method somewhat modified was adopted. The tip of the tube was cut off one inch from its end, leaving a shorter tip with an opening of about one-tenth of an inch in diameter. Special transfusion tips were inserted into veins of donor and recipient as before described, and by means of the short rubber connections the projecting arm of Kimpton tube was attached with ease to the special tip already inserted. Citrate of soda was used as an anti-coagulant, so the tube was not paraffined. Positive and negative pressure, instead of being controlled by pressure bottles, was maintained

by the use of a large aspirating syringe for thoracic work. If the tube method is to be used, these little changes greatly simplify the procedure.

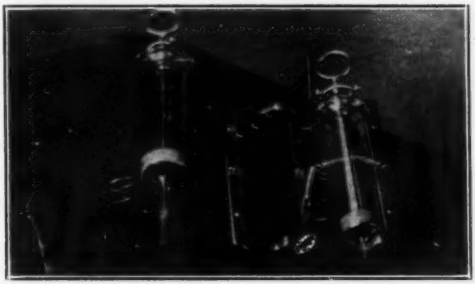
Realizing, however, that the tube method at its best was not the most practicable, a series of experiments was begun on dogs with the idea of determining the simplest, safest and most reliable method of blood transfusion.



D represents tip inserted into vein of donor; R, recipient; B, blood syringe; C, citrate syringe.

A special instrument was devised consisting of two syringes connected as follows: One syringe was filled with a 2 per cent solution of sodium citrate and this in turn connected with small rubber tubing to the vertical end of a glass "T" tube. One arm of the "T" was joined by rubber to the transfusion tip of the donor, the other end was united in the same way to one arm of a "Y" tube. The other arm of "Y" tube was connected to the transfusion tip of recipient, while the vertical shaft of the "Y" was joined to another syringe, which served to aspirate and inject blood. The principle involved here is very similar to the Unger device, although it is much simpler, safer and more rapid in its use, because there is no complicated metal apparatus involved, no ether spray is required during the transfusion, and large syringes are used, the larger the better, thereby saving time. By pressing on plunger of citrate syringe the entire tubing and tips are filled with citrate solution, then special tube forceps are applied to the connections of both transfusion tips. Still further pressure displaces piston of other syringe and fills it to one-eighth of its capacity with citrate solution. It is now ready for use, so the respective tips are inserted and tied into veins of donor and recipient. Clamp is now released on side of donor and blood aspirated to the capacity of the syringe. Blood in the donor tip is now displaced by pressing on piston of citrate syringe and rubber connection at this tip is again clamped.

Forceps on side of recipient is now released and the citrated blood is slowly forced into recipient. This tip is also flushed with citrate and the process repeated as often as necessary without fear of coagulation because of the constant flushing of connections with citrate solution.



Picture shows large syringe taken off frame, connected to special transfusion tip and ready for single transfusions. Syringe is now filled to one eighth of its capacity with citrate solution. Both special tips are filled with the same solution, clamped with non-serrated forceps, inserted and tied in veins of donor and recipient.

Apparatus dissembled showing metallic frame, large syringe, "Y" tube, transfusion tip, special tube forceps, transfusion tip with rubber connection and "T" tube.

The Kimpton Brown tube is also shown with the special transfusion tip connected.

With the use of this instrument eight experiments were performed on dogs. In the first two transfusion was from femoral to femoral of the same dog; the next four were from jugular to jugular of the same dog; the last two transfusions were from the jugular vein of one dog to the femoral vein of another. The dogs were all small, weighing from 20 to 25 pounds. Eight to ten ounces of blood were transfused during each experiment and in none did it seem to produce any harmful results. One dog, after having had twenty-four ounces of his blood transfused from one jugular to the opposite, developed a severe chill and died an hour after the operation. Dr. C. Jamison suggested that death

might have been due to the filarial worm in the heart and volunteered to autopsy the dog. This was done and filarial worms were found in the right auricle. Excepting this untoward incident nothing happened in the entire course of experiments which might tend to discredit the method. The syringes used in these operations were two-ounce capacity, glass barrel, glass-asbestos plunger.

The instrument used for human transfusions has syringes of the largest capacity, the one for blood being six ounces and the one for citrate four and one-half ounces, these being bladder syringes with adjustable rubber pistons. Solid glass syringes are the best, but the largest obtainable at present are 100 c.c. capacity. An order has been placed for two 250 c.c. solid glass syringes, catheter tipped, but because of the war it is very doubtful when deliveries will be made.

Four human transfusions have been performed by the new technic, the most important feature being the simplicity in administration with the use of only one assistant. Three of these were emergencies, so agglutination tests were not made.

The eighth transfusion was for shock and severe gastric hemorrhage following cholecystectomy for empyema of gall bladder with stones. Patient was sixty-two years old and pulseless at the time of the transfusion, so the result could not be determined, death resulting about one hour after the treatment.

The ninth case was one of post operative shock and hemorrhage following the removal of a large intraligamentary fibroid. Patient, fifty-six years old, built up wonderfully under the transfusion and made a splendid recovery.

The tenth transfusion was performed on a case of intestinal obstruction (volvulus). The patient came from the country, had been sick several days before receiving medical attention and was moribund at the time surgical aid was attempted. The treatment did no apparent good.

The indication for the last transfusion was hemophilia with profuse intestinal hemorrhage, patient having lost at least one quart of blood, and was still bleeding at the time of treatment. This was the third attack, but in all previous ones the hemorrhage was quickly controlled by the giving of horse serum. On this occasion, however, the serum failed. Twelve ounces of

blood was transfused from a brother of the sick man, both parties conversing and joking during the entire procedure. The donor left the institution immediately and the recipient left the next day, all hemorrhage having stopped and his general condition having greatly improved.

All of the transfusions enumerated in this article were performed on my own patients at Hotel Dieu of this city since May 1 of the present year.

The experimental work on dogs was done in the Miles Laboratory of Operative Surgery of Tulane University. The most complete equipment and excellent service greatly facilitated the work.

The first three transfusions by the new technic were performed by using the large syringe alone, with special transfusion tips inserted in donor and recipient respectively. In each instance the donor simply leaned back in a rocker while the blood was being drawn. The recipient was not disturbed from bed and was unaware of being transfused.

For the last infusion both donor and recipient were placed on separate tables with their feet pointing in opposite directions. The right arm of one and the arm of the other patient were extended from their bodies at right angles. The arms were then brought together and supported on a small table which was placed between the operating tables. Placing the patients in this fashion made it an easy matter to insert the tips into the distal and proximal ends of veins of donor and recipient, respectively. The rest of the procedure was the same as for any transfusion.

Advantages of the New Technic.

1. The apparatus is glass, metal and rubber and can be sterilized by boiling.

2. The paraffin coating of tubes, spraying of tips with ether and other complicated measures are done away with by the constant bathing of connections and mixing of blood with citrate solution.

3. It is simple, there being no complicated device for changing the blood current in direction, but by simply applying a clamp to the connection on donor or recipient tip, the current of blood or citrate is changed to the opposite direction.

4. It is an apparatus which can be improvised in any laboratory in a few minutes, any style of syringe being applicable, glass, metal, hard rubber, or glass-asbestos.

5. It is inexpensive.

6. The instrument, when disconnected, permits of single transfusions by means of the large syringe with the special tips and this, to my mind, represents the simplest of all methods where you do not wish to transfuse large quantities of blood or where the patient is so badly shocked that it is to his or her best interest not to be disturbed.

Before concluding, I wish to extend thanks to Dr. Dyer, Dean of Tulane School of Medicine, and Dr. Gessner for the use of the laboratory, instruments and paraphernalia in carrying out the experimental part of this work.

The day of transfusion is here. The hemorrhagic demand it, the septic call for it in unmistakable terms, the hemophiliac, anemic, those suffering from shock, and the most diverse ailments are often relieved and cured by this means when other measures fail—therefore let us acquire and adopt this simple technic, revive the lost art, give it a thorough trial, and rest assured it will win for itself the widespread application which it justly deserves.

DISCUSSION ON DR. NIX'S PAPER ON TRANSFUSION.

Dr. Homer Dupuy: I enjoyed the privilege of witnessing Dr. Nix's method of transfusion, as one of the cases was a chronic mastoiditis, with metastatic involvement of all the joints. I was associated with him in this case and was impressed with the ease in which the transfusion was effected. Especially noticeable was the action of the sodium citrate solution in keeping the blood fluid in its transit from the donor to the subject. This particular patient was intensely septic. I believe his life to have been saved through transfusion.

Dr. Danna: I feel that the medical organization owes a deep debt of gratitude to Dr. Nix for his valuable contribution. Had we known of this in by-gone years, many lives would have been saved, in accidents, especially with severe hemorrhages and following severe shock. I would like to ask Dr. Nix, however, concerning the danger of anaphylaxis, that is, the danger following the use of one person's blood into another person.

Dr. Jamison: We have great difficulty in experimenting on animals because about one-fourth are hemolytic to other animals. We can determine in the laboratory definitely whether one person's

blood is hemolytic to another person, and this test should always be made prior to transfusion. In persons of blood relation, the danger of hemolysis is greatly diminished.

Dr. Nix (in closing): I wish to thank the members for their active interest, generous discussion, and congratulations. Replying to Dr. Danna, for single transfusions with one syringe the most accessible and prominent veins are the ones selected, median basilic, median cephalic, or any others; for continuous transfusion with two syringes the median basilic veins of donor and recipient are preferable.

Agglutination tests of the two bloods are always made if the case is not one of the utmost urgency and if time permits. If hemolysis has not been eliminated the donor selected should be some intimate member of the family. In one instance the donor was a husband, agglutination tests were negative, and transfusion was begun. After one ounce of blood had been transfused the recipient suddenly became death-like in appearance, pulseless, and complained of a most intense pain in the region of the heart. Transfusion was discontinued.

Hemolysis did not take place in any of the dogs upon which we experimented.

HYSTERECTOMY FOR DOUBLE PYOSALPINGITIS.*

By LOUIS LEVY, M. D., New Orleans.

Having seen many cases in which the uterus was allowed to remain after both tubes were removed, and with the sequelæ of pain, backache, and the same general distressing symptoms minus the fever that the patient came to you for, and in this day and date in which rheumatism, arteriosclerosis, high blood pressure, bronchitis, and many other symptoms for which pus-foci were blamed, it is imperative that gynecologists do their part in the eradication of these foci in their field. While there are many factors to be considered, there can be no argument when both tubes are involved as to allowing the uterus to remain through which this infection has traveled.

It is understood when I say hysterectomy, I do not mean the removal of both ovaries, as it is just as much a fallacy to remove both ovaries as it is a fault not to remove the uterus. If one ovary cannot remain in situ, enough of ovarian tissue can always be gathered, and, if necessary, be sutered together to be grafted in the abdominal wall.

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It takes no more time to do a hysterectomy than it does to remove both tubes, and a hysterectomy is just as bloodless. The cry of conservatism as far as this operation is concerned is not used by the skilled surgeon. He knows that the uterus is allowed to remain by that type of man who thinks that a hysterectomy is a more shocking operation than a double salpingectomy.

The picture presented of a pelvis that requires a hysterectomy in pyo-inflammatory condition is, as a rule, that the ovaries and tubes are in the cold stage, and all the occlusion that is going to be there in the tubes is there at this time of operation, and you know you are seeing the patient to the best advantage; that is, after she has been in bed with the usual treatment of ice bags and douches until all the temperature and pain is as near gone as it is possible for the rest cure to obtain.

I mention cold stage in the operation of pus tubes to impress the fact that if a tube is diseased enough to be occluded, it is now seen as near well as it is possible for treatment to have it, yet it is diseased enough to be taken out, and if both tubes are diseased enough to be removed—the uterus that is their supply of infection is diseased enough to be removed also. Plastic work on occluded tubes attached to discharging uteri is of no value, and hysterectomies are best done by surgeons desiring positive, lasting results.

Some Practical Aids in Operation on Pus Tubes not Generally Given

Pus tubes are always curled in the posterior cul-de-sac, and are easily separated if the lines of cleavage are followed from below upward and towards the broad ligament. Care should be taken not to tear into broad ligament from below.

To remove pus tubes from above should never be attempted, as in this case the broad ligament or the vessels supplying the tubes are always torn, and much unnecessary bleeding encountered; a very common error in which easy cases are made hard.

Tubes should always be peeled from bowel, so that if any tearing is done it should be from the tube side, even at the risk of tubal rupture.

With best of relaxation, intestines should be well walled off with packs.

Where there is the least doubt of pus being spilled or oozing, drainage should be used.

Less surface for adhesions is seen after hysterectomy than after removal of pus tubes.

After supra-vaginal hysterectomy and cauterization of cervix, if discharge does not cease, cervix should be removed. Same can be done with local anesthesia.

The histories of the following cases, some of which and some which have not had their uterus removed, and those of which have not, I consider candidates for hysterectomy.

The etiology of these cases and the finding of a discharging endometrium after the uterus has been removed and cut open will convince one that a discharging uterus is beyond the pale of ice bags, curets or applications:

Case I. Mrs. I. M. Operated in 1910. Case of double pyo-salpingitis following gonorrheal infection. One tube removed, plastic work done in the other. Operated by me in 1911. The other tube removed, uterus anchored. She still has pain, discharge and being treated. She is not in my care, discouraged with surgery, and yet will not be cured until a hysterectomy is done.

Case II. Mrs. J. D. Operated May 25, 1909. Case of double pyo-salpingitis following gonorrheal infection. Tubes removed, cervix cauterized. Both tubes and one ovary removed, uterus allowed to remain. She still has discharge, but is satisfied with her condition and will have nothing further done.

Case III. Mrs. F. Operated April 13, 1914. Double pyo-salpingitis and oophoritis following induced abortion. Both ovaries and both tubes removed. Menstruation has ceased, but she still has a discharge. She douches daily, and is satisfied with her condition.

Case IV. Mrs. O. Double pyo-salpingitis following gonorrheal infection. Hysterectomy done, part of one ovary allowed to remain. She no longer menstruates, but has no pain. She feels generally well, has gained weight and is normal in every way. She is not displeased with the absence of menstruation.

Case V. Mrs. A. J. of Houston, Tex. Operated September 25, 1915. Double pyo-salpingitis, following induced abortion. Hysterectomy done, both ovaries had to be removed, parts of each taken and grafted in abdominal walls. She had an uneventful recovery, and wrote me six months after operation that at two months

after operation she had flushes and was nervous, all of which symptoms were controlled by medication. She is now apparently normal. She has no pain and no discharge.

Case VI. Mrs. I. M. Operated April 17, 1914. Double pyo-salpingitis following accidental abortion. Both tubes removed, one ovary allowed to remain. She now has painful menstruation and discharge. She refuses to be operated on again.

Case VII. Mrs. S. L. Operated May, 1915. Double pyo-salpingitis following gonorrheal infection. Complete hysterectomy done. Ovaries were not in condition to retain any part. Sinus continued to drain where drainage tubes were placed and she continued to have vaginal discharge. She was operated on again in May, 1916. At this operation cervix was removed. Cervix showed infection over entire area. Sinus closed promptly after its removal. She is now free of pain and discharge.

Case VIII. Mrs. E. J. Operated April 18, 1916. Case of double pyo-salpingitis following gonorrheal infection. Hysterectomy done, no ovarian tissue left. Made uneventful recovery. She is now free of pain and discharge.

Case IX. Mrs. N. M. Operated July 7, 1916. Double pyo-salpingitis following gonorrheal infection. Hysterectomy done, one ovary allowed to remain. Made uneventful recovery. She is now free of pain and discharge.

Case X. Mrs. E. P. Operated June 5, 1915. Had been operated a year previous. One tube has been removed entirely, and part of the other. She came for pain and discharge. Hysterectomy done. One ovary allowed to remain. She made uneventful recovery. She is now free of pain and discharge.

Case XI. Mrs. I. W. Operated April 13, 1914. Double pyo-salpingitis following gonorrheal infection. Hysterectomy done, part of one ovary allowed to remain. Made uneventful recovery. She is now free of pain and discharge.

Case XII. Mrs. B. Operated July 14, 1916. Double pyo-salpingitis following an abortion of ten years previous. This is probably the most interesting of all cases. This woman had bronchitic asthma starting three months after the abortion. She had been curetted immediately after the abortion. She had been treated by internists, and had been sent away and had gotton only temporary relief. Menstruation was painful, chronic discharge. She had been confined to bed with asthma three weeks pre-

vious to operation. Hysterectomy done, one ovary allowed to remain. She made uneventful recovery. Has had one slight attack of asthma in August. She is gaining weight, and is not nervous over absence of menstruation. She is now free of pain and discharge as well as bronchitis.

Nearly all of these cases were operated with local anesthesia and nitrous oxid gas.

Cases IV and VIII referred by Dr. Nelken; Case XII referred by Dr. Bel; Case XI referred by Dr. Poche, Ama, La.

Conclusions.

1. Whenever tubes are diseased enough to cause their removal, the uterus should also be removed. The uterus now being a useless organ is only a harborer of pus foci.

2. Menstruation is often manifested, after the uterus is removed and the cervix allowed to remain, by muco-sanguineous discharge at apparent menstrual periods.

3. The absence of menstruation is not a cause for nervous disorders, if the ovary is allowed to remain and the woman is explained that she will not menstruate any more.

4. Many cases of rheumatism, heart trouble, high blood pressure, and other conditions caused by pus foci may be explained by vaginal discharges.

5. Hysterectomy is as safe an operation and causes no more shock and takes no more time than the removal of both tubes.

DISCUSSION OF DR. LEVY'S PAPER.

Dr. Maurice Gelpi: The Society should be grateful to Dr. Levy for bringing up this important topic for discussion. Looking at the subject in a broad way, the question as to whether the uterus should be left in, in the type of cases in question, depends upon a number of factors. Among the most important factors to consider are the degree of damage to the pelvic organs and the type of infection present. I take it for granted that the discussion is to be limited to the chronic cases only, as these inflammatory conditions as a rule do not need surgical interference in the acute stage, except, at times, for vaginal drainage of a pelvic abscess.

In a general way, then, we have three main types of chronic infection to deal with: The puerperal or streptococcal, the gonorrheal and the tubercular.

In dealing with the first two types, it is important that the abdominal operation should be preceded by a more or less prolonged period of rest in bed, with an ice bag and douches, until the temperature comes down and stays down, for eight or ten days or bet-

ter two weeks, and until the leucocyte count is about normal. If after this treatment the patient still needs operation, there is a better opportunity for conservatism, the morbidity following operation and the mortality are distinctly less and furthermore, from the technical side, the case is easier to handle.

In the advanced streptococcal cases, usually the entire pelvic organs including the uterus require removal. In certain mild cases, it is sometimes possible to preserve the uterus and a good ovary or piece of ovary. In the advanced gonorrheal cases, usually the treatment is the same as in the advanced streptococcal. If, however, the case has been thoroughly rested, or if the inflammatory process is still restricted for the most part to the tubes, then double salpingectomy, leaving in one or both ovaries and the uterus, should be done. As we are dealing in these gonorrheal cases with a primary intratubal infection, the diseased tubes should be removed in their entirety. Furthermore, it is important to excise the cornua of the uterus with the tubes, as the gonococcus has been found to survive and thrive in this region, over long periods of time. When the cases so treated, however, continue to have a leucorrhea, usually **if the cornua have been excised,** the trouble is not in the endometrium, or in the body of the uterus, but in the cervical canal,—not an endometritis or metritis, but an endocervicitis. If the uterus has been left in, therefore, the cervical condition producing the leucorrhea can be efficiently treated from below, either by plastic work or cauterization. On the other hand, to prevent this cervical leucorrhea when supra-vaginal hysterectomy is done, it is important to ream out the mucosa in the cervical stump from the abdominal side, thereby removing practically all of the diseased gland bearing area. Consequently, if the uterus is not diseased, and if an ovary or a piece of ovary can be saved, the indication is clearly therefore to preserve both structures and the function of menstruation.

In the tubercular cases of advanced type, usually there is no choice but to remove the uterus and both adnexa. In early cases, however, especially in young girls, the treatment should consist of double salpingectomy, leaving in both ovaries and the uterus. We consider that tubercular pelvic peritonitis is primary in the tubes and that if you remove this primary focus and can preserve menstruation, the accompanying tubercular endometritis will get well. This is materially assisted by the periodic Bier hyperemia of menstruation. Fortunately it is possible to determine macroscopically whether the ovaries are tubercular or not, as the process usually is seen on the surface. If any doubt should arise, the ovary may be incised for inspection and left in or removed according to the findings.

As regards drainage when pus has been spilled in the cavity in these cases, it is not necessary to do so, if the case was properly prepared and rested as indicated. That is to say, if the total and

poly counts are normal and if the patient has been free from all temperature. I mean even 99 or 100 degrees—for ten days or two weeks, you can spill pus in the cavity, close without drainage and your patient will get well uneventfully, without the danger of a hernia and postoperative adhesions from a drain. We take cultures routinely from the pus spilled from these tubal collections and we have demonstrated repeatedly that, except in very rare instances, the pus is sterile. On the rare occasions when a growth has been obtained, the strain of organisms seemed to be of a very low resistance and clinically the patients did just as well as when the pus showed no growth whatever.

REPORTS OF CASES.*

By URBAN MAES, M. D., New Orleans.

Case I. The Conservative Treatment of Thrombo-Angitis Obliterans.
Case II. Foreign Body in the Esophagus.

Case I. Mr. J. D., age thirty-seven, native of Louisiana, white farmer, unmarried.

History by Dr. J. A. Bethea. Admitted to ward 71, Charity Hospital, March 2, 1916.

Family History.—Father died recently of paralysis. Mother living and healthy. Two brothers and two sisters living and healthy. One sister dead, cause unknown. No hereditary diseases.

Past History.—Fever at times. Mumps, measles and whooping cough. Gonorrhea four or five times. Sore on penis nineteen years ago. No secondaries. Sore well in about six weeks, but took treatment for three years. Drinks moderately. Smokes cigarettes.

Present Illness.—This started about ten years ago, when the fourth toe of the left foot got sore around the nail, the soreness spread rapidly, and the physician amputated the toe. A black spot was noticed on the stump five days after the operation and it was soon black to the ankle. He then came to the Charity Hospital, where he was treated for seven weeks with dry hot air and the foot apparently returned to normal. He went home and for three years had no more trouble.

In April, 1910 (about six years later), the third toe of the left foot got sore and was amputated after one month. The second toe of the same foot got sore a few days after this amputation, and soon became black up on to the foot. He came to the Charity Hospital then and was

*Read before the Orleans Parish Medical Society, September 25, 1916. [Received for Publication, October 11, 1916.—Eds.]

seen by Dr. Maes, who diagnosed it thrombo-angitis obliterans and amputated at the junction of the upper and middle third of the leg. This healed by first first intention and he went home well.

In May, 1914, he trimmed the nail of the large toe of the right foot, and the toe became sore, giving him much discomfort, so that he came back to the hospital. A few days later he noticed a sore on the side of the toe. The leg was baked daily and it improved considerably. This improvement seemed to be more marked after taking mercury and iodides. He stayed in the hospital for two or three weeks, when he went home and continued the baking with an improvised apparatus at home. The toe got worse and was amputated in January, 1915, and this foot has never bothered him since.

During his stay in the hospital in 1914, he had a Wassermann made, which was negative. Luetin, positive.

Physical Examination in 1914.—Fairly well nourished. Poorly developed. Arcus senilis both eyes. Pterygium on right eye. Many scars on body. One scar on penis. Cervical and epitrochlear and other glands palpable. Arteries palpable but not beaded. Lungs negative. Heart enlarged to left and downward. Aortic second sounds accentuated. Abdomen prominent. Stump of left leg is normal, with good circulation. Right foot cold, with no dorsalis pedis palpable. Veins not distended. Great toe inflamed and discharging pus under the nail. Right arm—B. P. Sys. 140, Dys. 130. Left arm—B. P. Sys. 130, Dys. 120. X-ray showed necrosis of terminal phalanx of great toe.

Present Condition.—Seven months prior to admission, the index finger of the left hand began to change color and became painful at times. Gradually all of the other fingers of the same hand became affected in the same way, with the exception of the thumb. The ends of some of the fingers became black and the tips sloughed off.

Hands baked for one week with no improvement.

Other treatment was discontinued and treatment was began with Ringer's solution by hypodermoclysis. This was given (500 c.c.) on March 15, 17, 20, 25, 29, April 7, 11, 26, and May 15.

The patient could notice distinct improvement after three treatments. The pain ceased after this time and the fingers commenced to heal and were completely well in about six or seven weeks after treatment was started. He has remained well since.

In a painstaking article, Willy Meyer of New York (*Annals of Surg.*, March, 1916) reviews the present knowledge of thromboangitis obliterans, especially its pathology and treatment. The case just cited is strikingly like the one cited by Meyer and forces upon us the realization of the hopelessness of this condition.

The typical case is usually seen in men between the ages of thirty and forty and is more common in the Jewish race, and differs still further from diabetic and senile gangrene in attacking individuals who are otherwise in a fair state of health. The first manifestation is usually a progressively deepening cyanosis accompanied by exquisite pain, neuralgic in character. These patients are afraid of dressings and it is with difficulty that any attention can be given the afflicted limb. The pain and cyanosis increase and a gradual mummification of the tissues involved takes place unless amputation is resorted to, or the process may change to a moist gangrene with all the accompanying constitutional phenomena.

The site of an amputation is a serious consideration. The risk of flaps sloughing in the poorly-vascularized tissue is very great. In a former paper the writer has advocated the application of the Moschowitz test to determine the limit of the active blood supply in an affected limb.

As amputation seemed to be the only remedy and as more than one extremity often becomes involved (both legs and one hand in my patient), the suggestions made by Bier, Von Oppel, Wieting, Bergheim and others were all welcomed. Active and passive hyperemia, reversal of the circulation, ligation of the main vein of the extremity as recommended by these investigators were only occasionally successful and gave way to the time-honored amputation. Of all the conservative methods, dry superheated air has given the best results.

According to Meyer, at the suggestion of Prof. Ito of Tokio, two of his assistants, Mayesima and Koga, made some studies on the viscosity of the blood in the extremities of patients suffering from Buerger's disease, and, based on their findings, have recommended the use of Ringer's solution by hypodermoclysis. After a trial on thirteen patients, Mayesima and Koga claim uniformly good results.

While in the patient cited above, the result was all that could be desired, further experience has not been so gratifying. I have under my care at present, in the service of Dr. Matas at Touro Infirmary, a Russian Jew afflicted with Buerger's disease, in whom nine injections of Ringer's solution did no good, and amputation through the middle of the calf became necessary to relieve the patient's suffering.

It is with some hesitancy that I have undertaken to test out the value of the Mayesima-Koga treatment. How any solution given by hypodermoclysis can dilute the circulation blood long enough to nourish a leg threatened with gangrene is hard to realize. However, the result in one case, despite the failure in another, certainly makes so conservative a treatment worthy of trial, remembering what is already dead must be cast off or removed, as it cannot be revived.

Case II. Foreign Body in the Esophagus.

On July 7, 1916, I was called to the Charity Hospital to see J. C., age two. The child seemed happy and was playing around the hall. The mother's story was that six days ago the child had swallowed a brass beer check. Since then it had not been able to swallow any solid food, but liquids were taken without any difficulty. The X-ray picture showed the foreign body to be on the root of the neck, just behind the manubrium.

After failure with the coin catcher and esophagoscope, I determined to perform a left-sided esophagotomy. This was technically easy and, despite the suture of the esophagus and drainage of the external wound, a virulent infection occurred with some sloughing, allowing all of the food taken by mouth to escape through the neck wound. The child was fed by proctoclysis and, passing the stomach tube, nourishment was given that way.

Despite a broncho-pneumonia, the child has made a good recovery and was seen by me a few days ago.

The accompanying picture shows the foreign body and its location.

DISCUSSION ON DR. MAES' PAPER ON FOREIGN BODY.

Dr. Homer Dupuy: My remarks are strictly impersonal, as I have the highest regard for Dr. Maes' technical skill as a surgeon. While those doing endoscopy cannot expect to equal the work of such a master in the art as Chevalier Jackson, yet the mortality from a properly conducted esophagoscopy is so low while that of esophagotomy is so high that the latter should never be resorted to until all the resources of endoscopy have been exhausted. Dr. Maes was so fortunate as to pluck success in the face of many odds and for this he deserves congratulations. This surgical procedure, however, should never have been practiced until esophagoscopy in trained hands had failed. As we see by the history, the case was not one of urgency, and thus the question is now brought to one of criticism relative to the Hospital authorities. I was rung up to attend the case. As no dyspnea, or other urgent symptoms were present, I judged the case could wait and offered to see it later in the evening, when more time could have been given to the details of endoscopy. I also suggested to ring up other throat men. Certainly, in the absence of untoward symptoms I feel that this child was not accorded the first, best and safest method of treatment. As a matter of common justice I wish to say, that there are a sufficient number of laryngologists attached to the Hospital staff doing endoscopic work to have made esophagotomy an absolutely last resort.

UNUSUALLY LARGE CYSTIC APPENDIX VERMIFORMIS.*

COMPLETELY COVERED BY PERITONEAL FOLDS OF TREVES, COMPLICATED WITH LARGE RIGHT OVARIAN DERMOID CYST.

By PAUL MICHINARD, M. D., New Orleans.

Case.—Alice Y., colored, age thirty-one, four children, three miscarriages. Last child two years ago (1914). No trouble was experienced during or after her deliveries. Menstruation always normal, excepting during past eighteen months, when the flow became more profuse and of longer duration. She entered the Charity Hospital, Ward 38, May 22, 1916, complaining of frequent attacks of abdominal pains for about two years. There were no typical attacks of appendicitis pains.

On examination the lower abdomen was felt to be filled with a movable, doughy-like mass, somewhat inclined to the right. Pressure over the right iliac fossa and in the neighborhood of McBurney's point did not cause any defensive contraction of the rectus muscle or any special suffering. Her temperature was normal. From the consistency of the tumor a dermoid cyst was diagnosed, and the history of repeated attacks of pain led to the suspicion of chronic appendicitis. Operation, May 30, 1916, revealed a six and one-half pounds dermoid filled with sebaceous matter and kinky hair. The tumor was freely movable and easily extirpated. The left ovary was found normal and not disturbed. On investigating for the appendix we found a sausage-like object filled with a clear serum-like fluid. With the exception of about one inch of its distal part it was completely covered by a thin, broad translucent and almost bloodless membrane, which also covered the cecum, to which, as well as a small surface of the appendix, it was slightly adherent. The accompanying photographs†, taken from Eastman's article that appeared in the April, 1913, number of *Gynecology, Surgery and Obstetrics,* well illustrate this case, excepting as to the bands attached to the ileum, which were not so broad.

*Presented at the Clinical Meeting of the Orleans Parish Medical Society, held at the Charity Hospitay, New Orleans, October 9, 1916. [Received for Publication, October 11, 1916.—Eds.]

†See cut on page 456.

This object was the appendix. It was astonishing with what difficulty it was removed from its pocket-like covering, finger and Mayo scissors accomplishing the separation. After removing the appendix, the membrane, which was almost bloodless, was excised, ligatures were placed on the stumps to prevent any possible post operative bleeding. The appendix which

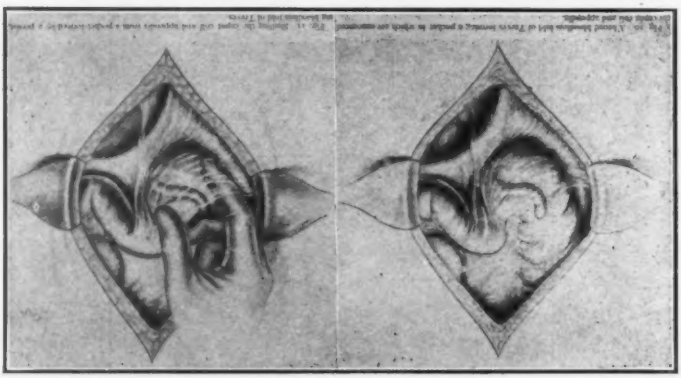
Cystic appendix, Dr. Michinard's case.

is shown to you measures about eight centimetres in circumference and seventeen centimetres in height.

Let us now turn our attention to the membrane which encased the appendix. It was certainly not of inflammatory origin. Its appearance was almost that of normal peritoneum. Excepting over the cecum and a small part of appendix it was not adherent,

and it did not bleed, or scarcely so, when cut. It was very broad. Speaking of these membranes Charles H. Mayo, in the March, 1911, number of *Surgery, Gynecology and Obstetrics,* said:

> We believe that this condition is undoubtedly due to the late rotation of the bowel and descent of the cecum from its hepatic position after the formation of the peritoneal cavity of the infant. The cecum burrows its way into position, as it were, through the peritoneum.



These membranes have been called the peritoneal folds of Treves, Jannesco and Reid, and also Jackson's membrane. That they are not of inflammatory origin seems to be the prevailing opinion to-day. Eastman seems inclined to call them the "bloodless fold of Treves." At this operation, which was completed in less than an hour, and from which the patient made a quick recovery, I was assisted by Dr. Frank Gomila.

PROCEEDINGS OF THE AMERICAN SOCIETY OF TROPICAL MEDICINE.

RECENT EXPERIENCE WITH IPECAC AND ITS ALKALOIDS IN THE TREATMENT OF AMEBIASIS.*

By SIDNEY K. SIMON, A. B., M. D.
New Orleans.

There is apparently complete unanimity of opinion at the present time regarding the specific amebicidal effect of both ipecacuanha and its alkaloidal principle, emetine, upon the infections in man produced by the *Entameba histolytica*. Though the crude ipecac root had enjoyed, for centuries back, a varying reputation as a remedial agent in all forms of dysentery, the recognition of its distinctive value in those dysenteries of purely entamebic origin, it should be remembered, is a discovery of comparatively recent times. The finding of the marked effectiveness of the drug in this particular field and the more exact methods of its administration are, in fact, the results of painstaking investigations, only brought to a successful culmination within the past decade.

In 1909, George Dock[1] and, shortly after, the writer himself[2] were able to report gratifying results with the use of ipecac in a series of cases of amebic dysentery, which had previously shown themselves refractory to other plans of treatment. The important feature pointed out in these experiences concerned the administration of the drug according to a special method which included its employment in pill form, each pill coated with a layer of salol of sufficient thickness to prevent dissolution in the stomach.

Up to that time the drug had not met with favor in clinical practice, largely because of the irritant effects it produced when brought in contact with the gastric mucosa in an unprotected state. With the employment of the enteric coated pills this objection was in the main overcome and the way was thus opened

*Read at the thirteenth annual meeting of the American Society of Tropical Medicine, held in Washington, May 9, 10, 11, 1916.

for a more extended use of this important agent in the control of the widely-prevalent entamebic diseases.

In 1912 a still further advance was recorded in the manner of exhibiting the drug in its full effectiveness. In that year Vedder[3], in the course of experimental investigations carried on with emetine, an alkaloidal principle extracted from the ipecac root, had shown the powerful amebecidal effect of this substance on the free living organisms in dilutions as high as 1-100,000. Within a short time following Rogers[4] was able to give a practical application and a clinical value to these tests. He employed the soluble hydrochloride salt of the alkaloid, making use of both the subcutaneous and intravenous methods of injection in a series of twenty-five cases of human entamebiasis, mostly intestinal in type. The results obtained proved to be highly striking and successful and prompt confirmation was soon derived from many sources.

A period of four years has now elapsed since the introduction of this new agent in the therapy of entamebic diseases, an interval sufficiently long, it would seem, to have allowed of a thorough testing out of its efficiency. During this time the use of emetine may be said to have almost entirely supplanted that of its parent drug, ipecac.

The question that now presents itself for consideration is whether the early claims made in behalf of emetine as an amebicidal agent superior in value to ipecac itself has been sufficiently justified. From a culling of the recent literature there would seem to be increasing evidence of doubt upon that score.

All authorities are agreed regarding the prompt effect of the alkaloid on the vegetable ameba, when used subcutaneously in doses of from one-half grain up. Clinically, the response to the emetine therapy is strikingly prompt and convincing. Within forty-eight hours following an injection of one grain a careful search of the stools may fail to reveal any trace of the organism previously present perhaps in large numbers. However, it need only be recalled in this connection that clinical results equally as impressive might be obtained from the use of the powdered ipecac administered by mouth. With both the parent drug and its alkaloid a clinical cure in the sense of a relief of active symptoms can with equal certainty be expected.

It is with the prevention of relapses, a sequel so characteristic of protozoan diseases, that the real effectiveness of these drugs should be judged and their relative merits be established. In this respect it would seem that ipecac possesses a far greater value than emetine. It has been my experience, after an extended and impartial observation, that relapses, though encountered with great frequency in the course of the emetine therapy, form a rare exception when the entire ipecac root is employed in full dosage.

The cause of relapses in amebiasis, as in other infections due to protozoa, may be traced to the tendency which the animal organisms exhibit to pass from the active vegetative state to a quiescent condition with the formation of cysts. Once in the encysted state the ameba becomes highly resistant to external influences and may, in fact, remain quiescent in the tissues for long periods of time, as is now universally recognized. The influence of emetine on the encysted ameba would seem to be quite small or even neglible in marked distinction to its well-recognized destructive effect upon the free living organism. Vedder[5], himself, acknowledges that " a large percentage of cases treated with emetine continue to harbor the *Entameba histolytica* in the encysted and most dangerous form in the feces for some time." Likewise Allan[6], Baermann[7], Gaide, and Monzels[8] and Marchoux[9] have all found that "the entamebæ are not expelled from the intestinal tract by the emetine treatment to the degree that the relief of clinical symptoms would lead one to expect."

More recently Phillips[10] states that "the effects of emetine are not permanent and that though the active amebæ are killed off very quickly, the drug has no effect on the cysts." Again, in a splendid summary of the subject, G. I. Jones[11], in analysing his experiences with a large material, makes the significant statement that while he considers emetine a most valuable agent in the treatment of intestinal amebiasis, "the use of this drug alone will not cure amebic dysentery." He has found that relapses will soon occur and strongly urges the employment of ipecac by mouth as a necessary step to achieve complete and permanent recovery.

The result of these extended and latter-day experiences with the emetine therapy would, therefore, appear to lead to the con-

clusion that the drug proves of splendid service as an agent for the destruction of the free living ameba in the tissues, whether in the intestinal tract or in the liver, but finds a somewhat restricted field of usefulness in the prevention of relapses when the amebæ have passed into their encysted cycle.

Another matter in connection with the use of emetine, to which increasing attention has been directed recently, concerns the possible toxicty of the drug on the human organism in doses ordinarily employed. In a very recent number of the *Archives of Clinical Medicine*, Levy and Rountree[12] report two cases of undoubted poisoning with emetine. In one case, representing a mixed amebic and luetic infection, death resulted from nephritis following the subcutaneous administration of emetine in average daily doses of one and one-half grains covering a period of twenty-nine days. In the other case, which had a less serious outcome, the toxic effect showed itself in a stupor lasting one week, after an unusually small dosage. These cases undoubtedly represent rare coincidences, considering the wide usage to which the drug has been put, and may possibly find an explanation, as the authors suggest, in an accidental impurity in the quality of the preparation.

However, much evidence is accumulating that milder types of toxemia are by no means uncommon. Lyons[13] a year ago was able to collect four cases of peripheral neuritis which could be traced directly to the effects of the drug and has recently communicated an instance of cardiac arythmia in an individual who took ninety grains of alcresta over a perid of six days. In summarizing his impressions upon this subject, Lyons states "that the evidence is increasing in the literature to the effect that the drug is not as harmless as generally supposed and that large doses are not without danger." Within the past year I have succeeded in obtaining records of seven additional instances of peripheral neuritis of unquestionable emetine origin. This complication, as well as other ill-effects at times mentioned in connection with the use of the drug, will be found to be due, I believe, in each instance either to the employment of an excessive daily dosage or to an injudicious prolongation of the treatment beyond limits of safety.

The toxic properties of the ipecac alkaloids revealed in part

above, as well as the pharmacology of the drug as a whole, it should be remembered, had been worked out in an experimental way several years back. Emetine had, in fact, been known as early as 1817, having been introduced by Pelletier[14], a French chemist, as a term to include the total alkaloid obtained from the ipecac root. The use of the term was continued in this sense until 1894, when Paul and Crownley[15] showed that the root consisted, in fact, of two distinctly active alkaloids, to which they gave the names Emetine and Cephaline. The physiologic and toxic action of these two alkaloids upon the human organism, as well as upon some of the lower animals, was tested out a year later by Wild[16], who found that the effects they produced were to a great extent similar in character.

Though emetine has been used extensively in a clinical way, as we have seen, since 1912, for its active amebicidal effect the possibilities of cephaline in this particular field have been more or less overlooked. Leonard Rogers, in a paper contributed to the Asiatic Society in Bengal in 1914, related some observations he had made concerning the relative therapeutic value of emetine and cephaline in entamebic diseases. He administered the drug by the subcutaneous route and concluded that emetine in almost every particular was superior in effectiveness to cephaline.

With a view toward the further testing out of the possible influence of cephaline upon intestinal amebiasis, I have recently taken occasion to employ this agent in some six cases, each presenting active clinical symptoms. For this purpose I have made use of both the subcutaneous and oral methods of administration in turn, and the dosage employed has ranged from one-half to one grain. The results I have obtained, I must confess, have been, upon the whole, somewhat more favorable than those reported by Rogers. The number of clinical cases is not, of course, sufficiently large as yet to permit of very definite conclusions, but I have thought it might nevertheless prove instructive at this time merely to summarize the impressions which had been gained from the observation of these cases.

1. Cephaline would seem to possess an amebicidal action upon the free-living entameba to a degree equal to that of emetine in the same dosage.

2. The destructive effect of cephaline upon the encysted

organism would appear to afford more promise of success than that induced by emetine. One of my cases has remained free from relapse for a period of five months, with no reappearance of the cysts in the stool during that time after repeated examinations.

3. The administration of cephaline by the subcutaneous route produces considerably more irritation and pain at the site of puncture than does emetine.

4. Evidences of gastric disturbances accompanied by nausea and vomiting are encountered with more frequency and to a greater degree with the use of cephaline than with emetine.

5. There is less tendency to diarrhea in the course of the cephaline therapy than following the use of emetine.

6. The employment of a combination of the two alkaloids by hyperdermic injection would seem to promise a greater amebicidal effect than is obtained with emetine alone.

7. No evidence of toxemia was observed following the employment of the comparatively small doses of cephaline.

In conclusion, I wish to acknowledge my indebtedness to the Parke, Davis & Company Laboratory in Detroit for a liberal supply of the cephaline used in these experiments.

1. Paper contributed to American Society of Tropical Medicine, 1909.
2. **Jour. Amer. Med. Assn.**
3. Bull. Manila Med. Soc. (1911), 3, 48.
4. **Ther. Gazette** (1912), 36, 837.
5. **Jour. Amer. Med. Assn.,** Vol. LXII, p. 501.
6. **Ibid.** 1913 (60).
7. **Munch. Med. Woch,** 1913 (60).
8. **Bull. Soc. Path. exotique,** 1913 (6).
9. **Ibid.**
10. **Brit. Med. Journal,** Dec. 19, 1914.
11. **Jour. Amer. Med Assn,** Mar. 20, 1915.
12. March, 1916.
13. **Amer. Jour. Med. Sciences,** July, 1915.
14. **Annals Chem. et Phys.** (1817), 4, 172.
15. **Phar. Jour.** (1895), 25, 111.
16. **Lancet** (1895), 2, 1274.

CURRENT LITERATURE

FURTHER PROGRESS IN THE USE OF RADIUM IN THE FIELD OF LARYNGOLOGY, D. Bryson Delavan, M. D.—Decided advances have been made during the past year in our knowledge of the application of radium in disease of the upper air passages, while the number of the conditions in which it is found effective is being steadily increased.

An interesting condition in which radium has no rival is in the reduction of lymphoid tumor cases, as found in tumors of the tongue, called hemolymphangioma.

The treatment by radium of papillomata of the larynx, as with warty growths in general in other parts of the body, is being attended with ever increasing success.

Leucoplakia of the tongue, Abbe believes, is as capable of cure by radium within the mouth as is the skin hyperkeratosis. In the mouth, however, the duration and the method of application require more judgment and skill to attain good results. The treatment is associated with transient painful irritation, but this seems essential to success. Chronic abrasions and fissures of the lip are curable by radium.

In the treatment of nevus, excellent results are being obtained.

New growths of nonmalignant type are receiving an increasing amount of attention, with excellent results. Thus, Abbe has shown a case of myeloid tumor of the lower jar completely cured.

Tumors of the larynx of various kinds have been caused to disappear, with complete return of the singing voice.

In the field of nasopharyngeal fibroma the use of radium is most encouraging, particularly so in view of its success in the treatment of fibromata of the uterus.

Two cases observed by the writer, of sphenoid carcinoma, are worthy of notice. Both originated in the left side of the throat, close to the wall of the larynx, probably extralaryngeal. Both were seen late, long after operation would have been possible. Both patients were men in the early fifties, hitherto in perfect health, active, vigorous, and of good antecedents. When first seen, the disease in both had invaded the interior of the

larynx, the left lateral wall of the pharynx, the pyriform sinus, the tonsil, and the base of the tongue. In both, ulcerations were present and there were marked asphonia and dysphagia. Both were treated at the same institution, exposed to large doses of radium, and in both the results were materially the same. The first effect locally was an almost immediate control of the secretions of the throat. From having been abundant and fetid, they promptly ceased. Following this, the areas of ulceration rapidly diminished in extent, and in the less severe of the two cases disappeared, while in the other case they seemed to do so. The swellings, which had appeared over extensive areas of the affected parts, decreased markedly, and the infiltrated tissues were reduced in size, became soft to the touch, and more natural in appearance. Meanwhile the voice became clearer and deglutition improved so that both patients were able to swallow without pain and to largely increase the variety of their food. The general improvement was remarkable. Digestion became normal, and sleep more prolonged and restful. Strength increased steadily, and there was an almost normal condition of good spirits. One patient, a physician, was able to resume office practice and operative work for a period of over two months. Both have agreed that if the further progress of the disease should be entirely unfavorable, the benefit gained in the relief of suffering and the added comfort afforded would well have repaid them for any inconvenience which the radium had caused, whether from burns of the skin or from any other result.—Abstract, Report Thirty-eighth Annual Meeting, American Larynogological Association, 1916.

Angioma of the Larynx, Emil Mayer, M. D.—This affection is of very rare occurrence, the writer having found only forty recorded cases in the world's literature.

He presented the history of a woman, aged fifty-two years, who had a history of previous attacks of laryngitis with hemoptysis, and who had a tumor in the larynx on the left side, extending from the left false cord and covering the true cord on that side.

The diagnosis of cancer of the larynx had been made by laryngologists who had seen her previously.

The patient was admitted to Mount Sinai Hospital, and the

writer asked to report upon her condition and remove a portion of the growth for diagnosis, if necessary.

Owing to the yielding character of the growth, its bluish tinge, and the history of previous bleeding, the diagnosis was made of angioma of the larynx by Dr. Mayer. Removal of a portion for diagnosis was deemed too dangerous, and external operation was advised. This was subsequently performed by Dr. C. A. Elsberg.

The growth was removed, the mucous membrane sutured, and the pathologist reported it to be a hemangioma.

The patient made an uneventful recovery.

The writer concludes that angioma of the larynx is a rare diseases, occurring mostly in adults, the proportion of males to females being about four to one. It may be mistaken for cancer. Endolaryngeal removal, even of a portion of the growth, for diagnosis is fraught with danger, while laryngofissure is entirely safe and feasible.—*Ibid.*

SORE THROAT CLINICALLY CONSIDERED, Samuel Johnston, M. D.—In the clinical study of "sore throat" we should scan the physiognomy of the patient, mark well any changes in the voice tones, and note the odor of the breath before entering into a more detailed examination of the case.

Among the conditions causing changes of the voice may be mentioned paralysis of the soft palate, defections in the conformation of the palatine arch, swollen tonsils, benign and malignant growth in the nasopharnyx, laryngeal inflammations, paralysis, and so forth.

The odor of the breath may call attention to such conditions as uremic poisoning, pulmonary gangrene, ozena, necrosis of the nasal bones, and so forth. The need of careful inspection of the lips, gums, teeth, tongue, palate, pharynx, nasopharynx, lingual tonsils, epiglottis and larynx is emphasized.

In examining the nasopharynx an ulcer, usually of an infectious nature, is found here when least suspected, and in infectious diseases sore throat is by no means uncommon.

The writer's experience has proven that diseases of these regions differ in no way from similar pathologic changes in other parts of the body, and should receive the same therapeutic and surgical treatment.

Conservative and mild measures, hoever, should be the rule and guidance.—*Ibid.*

Ringworm on Hands and Feet.—O. S. Ormsby and J. H. Mitchell remark that cases of ringworm occurring on hands and feet are unlike the ordinary skin disease of that type occurring elsewhere, and are examples of what are ordinarily termed dysidrosis or eczema of the vesicular-vesiculopustular or intertriginous type. What proportion of them is mycotic requires investigation, but the number seems to be large. The essential lesion is probably in all cases a vesicle, solitary or multiple, and grouped or scattered. The contents are usually clear and there is no erythema surrounding it as a rule. In the course of a few days the fluids absorb, leaving a brownish macule, and eventually the roof of the dried vesicle becomes torn and scales off, exposing a red, smooth, shiny surface, with a border of upturned scales. The subsequent course depends on the number of vesicles and their location, and probably also on the type of the invading organism. If the vesicles have been discrete they may leave only slightly scaling areas which may still harbor the organism, and instead of scaling off, the roof of the vesicle may produce a yellowish brown keratotic button containing many mycelial threads, and under which there is little or no trace of the usual shiny red surface. If the vesicles have been grouped, however, they may grow together and even produce bullae. Unmolested these may heal spontaneously, or extend, and if irritated by caustics, cause severe eczematous dermatitis. The location of the lesion determines largely the condition which the organisms must proliferate. and hence the type of lesion. In all cases observed, the interdigital surface of the fourth interspace of the toes is most commonly affected. Rarely the process extends backward on the plantar surface of the foot. The reason for this localization is that the shoe causes the fifth toe to be constantly flexed and adducted, and finally the last two toes may become so stuck together that cleansing is difficult, and the continuance of the growth is especially favored. The invading organism in most cases is *Epidermophyton inguinale*. They give an analysis of sixty-five cases seen in ordinary private practice, five-sixths of which were in males. The subjective sensations vary from nothing at all to complete incapacity to walk. The treatment

consisted of three preparations. In the severer cases a preliminary soothing element treatment of naftalan combined with zinc oxid and starch was used, followed by 5 per cent chrysarobin in a chloroform solution of gutta percha painted on until a good reaction occurred. Ordinarily this last was immediately prescribed, and directions given for use five times a day. In another series of cases, an ointment of salicylic acid and benzoic acid, two and four parts, respectively, in thirty parts of oitment base was used. Chrysarobin was used alone in thirty patients. The authors' conclusions are as follows: 1. Eczematoid and dysidrotic lesions of the volar surfaces due to myotic infection are much more common, at least in the Middle West. than the number of reported cases indicate. 2. The disorder occurs more frequently in men than in women, more frequently on the feet than on the hands, and more frequently in the warm and damp than in the cold and dry seasons. 3. The essential lesion is a deep-seated vesicle, in the roof of which mycelial threads may be found. 4. The areas affected, in the order of frequency, are (*a*) the fourth interspace of the foot, (*b*) the plantar surface of the arch, and (*c*) over the tuberosity of the fifth metatarsus. 5. The disorder frequently follows or precedes eczema marginatum, and is due in many cases to the same organism. 6. The pathogenic fungus may remain dormant in the cutaneous folds of the feet throughout the winter months. With the advent of warm weather an acute attack of vesication, desquamation and maceration may occur.—*Jn'l. Am. Med. Assn.,* September 2, 1916.

Focal Infection.—The laws which govern the perpetuation of pathogenic microrganisms involve a life of parasitism harmless to the host or of varying degrees of pathogenicity. Apparently any specific type of the bacteria discussed may attain the biochemic qualities which permit them to exist in the host as harmless parasites or as injurious agents possessed of a special or general pathogenicity of varying virulence. The varying pathogenic qualities, special and general, may be acquired in the host or in the passage from host to host (man or animal), or may be brought about in culture media. The host confined infection (focal) seems to be a site in which the specific agents may attain specific pathogenicity chiefly in the nature of tissue

tropism (elective tissue affinity). This special quality is not recognized necessarily by cultural characteristics. The power to hemolyze or to produce green color in blood-agar plates by some members of the streptococcus group does not necessarily indicate specific pathogenicity or degree of virulence. The special or general pathogenicity of the host, measured by many factors cited in the paper, may determine the severity, acute or chronic, the extent, local or general, and the site, election of tissue, of the systemic infection. It is believed that these conclusions have been sustained by clinical observations and bacteriologic research. —*Ibid,* September 16, 1916.

Focal Infection in Skin Diseases.—M. L. Ravitch says that it is an unfortunate fact that dermatologists have too much neglected the search for the true etiologic factors of skin disease and given more attention to nomenclature and classification. There has been a change recently in this regard, and credit is due to Billings and Rosenow, whose theory of focal infection has opened our eyes to the explanation of certain dermatoses of obscure etiology only a few years ago. With the key we now have we can illustrate his statements, and they are only a few selected ones out of many. Not all systemic and skin derangements are due to focal infection. Many obscure diseases may be traced to faulty internal secretions, but these again on their part may be due to focal infection. It all teaches us to be on our guard and thoroughly examine doubtful cases, and above all, he says, let us treat the skin not as a surface only, but as a cutaneous organ, as capable of infection from within as any other organ.—*Ibid,* August 5, 1916.

Reed's Bacillus of Epilepsy (A. J. Hinkelmann). Through the work of Reed,* the question of a specific organism as the exciting cause of seizures of epilepsy has been set forth. Having previously worked from a different basis with an organism believed to be the same as the one isolated by Reed, and having since the appearance of his articles, succeeded in finding the organism in the blood of an isolated case of epilepsy, Hinkelmann adds a few facts to what Reed has already said.

Reed has made very clear the point that the organism is evidently taken into the intestinal tract by way of the mouth, and

*Reed, Charles A. L.—**J. A. M. A.,** Jan. 29, and May 20, 1916.

enters the blood through a cecal or an appendiceal focus, and leaves the question open as to the danger of communication. What would be the consequence in case the organism was ingested by a normal individual, and to what extent may those with predisposing lesions expect to escape infection?

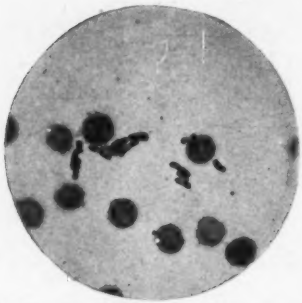
From a basis of experiments conducted during the summer of 1915, and before he had any knowledge of the pathology of the organism, the author says it is a very frequent inhabitant of the intestinal tract of probably the majority of people; that it is one of the regular members of the so-called intestinal bacteria.

The organism has high resistance to germicidal agents, and through this fact it becomes an easy matter to demonstrate its presence in the intestinal flora and also that it is commonly present. It will live in phenol solutions of from 5 to 10 per cent for many hours and a much higher strength is necessary to kill it instantly. Among the very large number of different species of bacteria that are usually found in the intestines, it is commonly the only one that will survive a thorough treatment of the stool with a 5 or 10 per cent phenol solution.

The method of isolation was as follows: From 25 to 30 grams of solid feces were made into an emulsion with 50 cc of a 5 per cent. solution of phenol and allowed to stand for 30 minutes or an hour; cultures were made on agar slants and incubated. I have never made such cultures from the stools of epileptics with the view of noting how numerously the organism is present, but in normal individuals, a loopful of the above emulsion spread over an agar slant will yield from 1 to 6 colonies after twenty-four hours of incubation.

The organism is highly hemolytic, and to this last fact may be due a part of the pathological conditions present in epileptics. Cultures made on blood agar plates will show a hemolytic spot at the point of a growing colony long before the colony itself becomes visible. In the case that came under my observation, I found it abundantly present in the capillaries, and both the spores and the organism could easily be demonstrated in smears from the blood directly.

In view of the fact that the organism does enter the circulation and there multiplies into great numbers and is so generally found in the bood of epileptics, the conclusions of Reed



Bacillus epilepticus directly in blood smear from an epileptic patient five hours after seizure.

as to its specific nature become at least very plausible. It would be hard to conceive that an organism with such a high hemolytic property could enter the circulation and multiply to such numbers as smear preparations from the blood indicate without producing diseased conditions within and resulting in corresponding clinical manifestations without.

At any rate, what has already been established in regard to the organism makes the question one most worthy of serious consideration and extensive investigation. The universal presence of the organism in the intestinal flora is no argument against its probable pathology, but simply adds the blood stream, in consideration of the question of treatment.

If further investigation should finally establish that the *Bacillus epilepticus* is the exciting cause of the seizures of this disease, little probably can be hoped for in the way of prophylaxis or cure through efforts to prevent the organism from entering the intestinal tract or to eradicate it when present. The best attention probably will have to be directed toward those lesions which open the way for it from the intestines into the circulation.—*New York Medical Journal.*

NEWS AND COMMENT.

PRINCIPAL CAUSES OF DEATH.—According to a preliminary announcement with reference to mortality in 1915, issued by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce, and compiled under the direction of Mr. Richard C. Lappin, chief statistician for vital statistics, nearly one-third of the 909,155 deaths reported for that year in the "registration area," which contained approximately 67 per cent of the population of the entire United States, were due to three causes—heart diseases, tuberculosis, and pneumonia— and nearly two-thirds were charged to twelve causes—the three just named, together with Bright's disease and nephritis, cancer, apoplexy, diarrhea and enteritis, arterial diseases, diabetes, influenza, diphtheria, and typhoid fever.

The mortality rate from typhoid fever has shown a most gratifying and remarkable decline since 1900, having dropped from 35.9 per 100,000 in that year to 12.4 in 1915, the decrease amounting to nearly two-thirds. This decline is greater, relatively, than that shown for any other important cause of death. The total number of deaths due to typhoid fever in 1915 was 8,332. Improved methods of sanitation, including the betterment of the water supply and sewerage systems, the campaign against the fly, and other preventive measures, have proved their efficacy in a striking manner by a reduction of almost two-thirds in the typhoid death rate during a period covering but a decade and a half.

That the "safety-first" campaign, inaugurated a few years ago, has borne good fruit is brought out by the figures for accidental deaths. For 1913, 54,011 deaths were reported as due to accident; for 1914 the corresponding number was reduced to 51,770, and for 1915 to 51,406; and during this period there was not only an increase in the population of the registration area as it existed in 1913, but an increase in the extent of the area itself. The rate per 100,000 population for accidental deaths fell from 85.3 in 1913 to 78.5 in 1914 and to 76.3 in 1915. There has been a very considerable reduction in fatalities due to rail-

way, street-car, mine, and machinery accidents, and the increase in those resulting from automobile accidents has not been as rapid as the increase in the number of machines in use.

The number of suicides reported for 1915 was 11,216, or 16.7 per 100,000 population. The suicide rate has not varied very greatly during the past 10 years.

DEATHS CAUSED BY FIREARMS.—The census figures bring out the astonishing fact that during the year 1915 firearms caused more deaths than railroad accidents, more than five times as many as railroad and street-car accidents combined, and more than twice as many as automobile accidents. The total number of deaths due to the use of firearms in the registration area in 1915 was 7,994, corresponding to a rate of 11.9 per 100,000. Of these deaths, 3,608 were suicides, 2,885 were homicides, and 1,501 were accidental (including those concerning which the status as to suicide, homicide, or accident was in doubt). The suicidal use of firearms has increased from year to year since 1913; the frequency of accidental deaths due to their use shows a slight decline during recent years; and the homicidal use of firearms shows a decline as compared with 1913 and 1914 but an increase as compared with 1910, 1911 and 1912. No separate data as to homicides by firearms for the years prior to 1910 are available.

RURAL HEALTH—AMERICA'S FIRST DUTY.—In an address delivered before the Senate on the subject of "Rural Health—America's First Duty, Senator Joseph E. Ransdell of Louisiana said: "The estimated economic loss which our nation suffers each year from typhoid fever and malaria alone aggregates $928,234,880, leaving out of entire account the sorrow, the unhappiness, the misery and the inefficiency which follow in their train." Senator Ransdell pointed out the fact that as valuable as it may be to increase the health of livestock and vegetation, it is of far greater importance that we throw every safeguard around the health of the man who is responsible for that livestock and vegetation. "Over $9,000,000 lost to us every year! A sum which is sufficient to put our country into a state of preparedness equal to that of any nation in the world, enough money to give us the largest navy afloat and the most efficient army which the world has ever seen, is annually offered up as

a sacrifice to two diseases which are entirely preventable. Enough money to pay the annual expenses of every college student in the United States is absolutely thrown away every year."

THE RICHEST MEDICAL SCHOOL.—Two million dollars has been appropriated to the University of Chicago, by the General Education Board in co-operation with the Rockefeller Foundation, for the establishment of a high-grade medical school. The university will appropriate at least the same amount and will give a site valued at $500,000. An additional sum of $3,000,000 will be raised by the university. The new medical school will start with an initial endowment of almost $8,000,000, which, according to Abraham Flexner, is the largest ever provided for any college of medicine in the world.—*Daily Press.*

MIDWIFERY SCHOOL OPENS.—The new school of midwifery, a department of Loyola University, New Orleans, was opened on November 2, 1916. Fifteen applications were received, several of which were trained nurses. Dr. J. W. Newman is dean of the new department. The course will be held at the Lying-In Hospital, Howard Avenue and Lee Circle, which will be the clinic. No person can enter the class whose moral character is not of the highest type. A new class will be started at the beginning of each month, which will allow persons who desire to take the course to enroll.

NEW SANITARIUM IN ALEXANDRIA.—A modern sanitarium to cost $50,000 is proposed for Alexandria, La., in the near future. It is planned to donate an entire block of ground in a prominent locality in that city if the order of the Sisters of Charity of the Incarnate Word will erect a modern sanitarium and maintain it. The offer is being made to the Sisters by Drs. R. O. Simmons, G. M. G. Stafford, King Rand and I. F. Littell, who will donate the land, and hearty co-operation of all the physicians in the city and the citizens in general is solicited to make the movement a success.

EXAMINATION FOR ASSISTANT SURGEONS IN THE UNITED STATES PUBLIC HEALTH SERVICE.—These examinations will be held December 4, 1916, February 5, 1917, April 2, 1917, and June 4, 1917, in various cities, for the convenience of candidates taking the examination. Further information will be furnished

by addressing the Surgeon-General, United States Public Health Service, Washington, D. C.

ETHER DAY AT THE MASSACHUSETTS GENERAL HOSPITAL.—The seventieth anniversary of the use of ether as an anesthetic during a surgical operation was observed on October 16, in the new Moseley Memorial Building of the Massachusetts General Hospital, Boston. The meeting was opened by Dr. Henry P. Walcott, president of the corporation and chairman of the board of trustees of the hospital, and addresses were delivered by Dr. Herbert B. Howard, superintendent of the Peter Bent Brigham Hospital, Boston, and Dr. Haven Emerson, health commissioner of New York.

MEDICAL SOCIETY OF THE UNITED STATES.—This newly organized society held its first meeting in St. Louis, Mo., October 3, 4 and 5. Committee reports on organization and arrangement, with the address by the president, Dr. A. H. Ohmann-Dumesnil, and a scientific program in the afternoon, formed the first day's business. The scientific program was continued through October 4 and 5, with a reception for the president-elect, Dr. Emory Lanphear.

HOSPITAL FOR DEFORMITIES RECEIVES GIFT.—Mr. Herbert Kauffman, of Pittsburgh, through Dr. H. C. Frauenthal, has presented the Hospital for Deformities and Joint Diseases, New York, with a gift of $1,000,000, to be used for the erection of a new building and for an endowment fund.

CLINICAL CONGRESS OF SURGEONS.—The seventh annual meeting of the Clinical Congress of Surgeons was held in Philadelphia, October 23-27. More than 1,600 members were registered from all parts of the United States, Canada, and abroad. The following officers were elected: President, Dr. John G. Clark, Philadelphia; first vice-president, Dr. George Henderson [illegible], Galveston, Texas; second vice-president, Dr. Edgar W. Allin, Edmonton, Alberta, Canada; secretary-general, Dr. Franklin H. Martin, Chicago (re-elected), and treasurer, Dr. Allen B. Kanavel, Chicago (re-elected). The next meeting place of the congress will be New York City in 1917.

AMERICAN COLLEGE OF SURGEONS.—On October 27 the fifth annual meeting of the American College of Surgeons was held in Philadelphia, when 232 fellowships were conferred. Dr.

Ernest Sidney Lewis, of New Orleans, received the honorary degree. The following officers were elected: President, Dr. George W. Crile, Cleveland; first vice-president, Dr. Robert G. Leconte, Philadelphia; second vice-president, Dr. Rudolph Matas, New Orleans; general secretary, Dr. Franklin H. Martin, Chicago, and treasurer, Dr. Albert G. Ochsner, Chicago.

CLEAN HANDS.—In view of the fact that disease germs lead a hand-to-mouth existence, because of the inability of the human race to keep the unwashed hand away from the mouth, the United States Public Health Service has formulated the following simple rules of personal hygiene, and recommends their adoption by every person in the United States: Wash the hands immediately before eating, before handling, preparing or serving food, after using the toilet, after attending the sick and after handling anything dirty.

VACUUM BOTTLES TO CARRY VIRUS.—In order to carry the tubes of virus into the interior of the Philippine Islands, the Bureau of Public Health has hit upon the plan of packing the tubes in ice in vacuum jars after the fashion of an ice-cream freezer. In these jars ice can surround the tubes of virus, and although the ice may melt before the end of the journey, the water will keep cool a long time after. A test was made by the Bureau of Health in Manila and it was found that after 127 hours (over five days) the ice in the vacuum container had melted, but had risen only to 50 degrees Fahrenheit.

AMERICAN MEDICAL EDITORS' ASSOCIATION.—At the forty-seventh annual meeting held in New York, October 24, 25, 26, the following officers were elected: President, Dr. George Morris Piersol, Philadelphia; vice-presidents, Dr. Geo. W. Kosmak, New York, and Dr. Robert M. Green, Boston; secretary-treasurer, Dr. Joseph MacDonald, Jr., New York.

SAVING IN SERUM AND VACCIN.—Under the system of distributing biologic products, the State Board of Health of Texas reports that from September 1, 1915, to July 1, 1916, the saving to the people of Texas was $74,717.15, because of the reduction in the price of serum and vaccin points.

NATIONAL BOARD OF MEDICAL EXAMINERS.—The Board held its first examination from October 16 to 21, in Washington, D. C. There were thirty-two applicants from seventeen States,

representing twenty-four medical schools, and of these sixteen were accepted as having the necessary preliminary and medical qualifications, ten of whom took the examination. The following passed: Drs. Harry Sidney Newcomer and William White Southard, John Hopkins University; Orlow Chapin Snyder, University of Michigan; Thomas Arthur Johnson and Hjorleifur T. Kristjanson, Rush Medical School. The second examination will be held in Washington, D. C., June, 1917. Further information may be had by applying to Dr. J. S. Rodman, secretary, 2106 Walnut Street, Philadelphia, Pa.

Nobel Prizes Reserved for 1917.—According to an announcement from Sweden on October 28 there will be no Nobel prizes for science or medicine for this year, but the money will be reserved for 1917. The Nobel prize for 1915 has also been reserved and will be awarded to the special fund.

To Abolish Heroin.—At a meeting of the Committee on Drug Addiction of the National Committee on Prisons, which was held in New York, resolutions were adopted stating that since heroin is not so indispensable a drug that its place cannot be easily taken by other drugs and measures that do not menace public welfare, it was recommended that Federal legislation be asked to prevent the importation, manufacture and sale of heroin. Discussion at the meeting revealed a consensus of opinion that heroism is, among drug addicts, most prevalent among boys and in the early decades of adult life, and, therefore, the chief promoter of vice and crime.

Damages Against a Midwife.—It is reported from San Francisco that on October 24 the Supreme Court of that city awarded damages to the amount of $25,000 against a graduate midwife who had not taken the proper care of a baby's eyes, with the result that it became blind from ophthalmia neonatorum.

Beri-Beri in New Bedford.—Six cases of beri-beri were discovered aboard a schooner recently arrived in New Bedford, Mass., from the West African coast. The patients were the captain, two officers and three sailors of the crew.

Intern Vacancies for Women Physicians.—The New York Infirmary for Women and Children, a general hospital of 95 beds (exclusive of new-borns), announces that there will be

four vacancies for interns. The term of service is for one year and the vacancies are to be filled July 1, 1917, and September 1, 1917. For further particulars *apply with credentials* until January 15, 1917, to Dr. Emily Lewi, 35 Morris Park, West, New York City.

ARMY MEDICAL CORPS.—Examinations will be held early in January for appointment of first lieutenants. There are 228 vacancies, and the examination will be held at various stations to suit the convenience of candidates. Application should be made to the Surgeon General, United States Army, Washington, D. C.

SOUTHERN MEDICAL ASSOCIATION MEETING.—At the annual meeting of the Southern Medical Association, which was held in Atlanta, November 13-16, the following officers were elected for the ensuing year: President, Dr. Duncan Eve, Nashville; first vice president, Dr. Stewart Roberts, Atlanta; second vice president, Dr. Bransford Lewis, St. Louis; secretary-treasurer, Dr. Seale Harris, Birmingham. Dr. Robert Wilson, Jr., of Charleston, retiring president, became a member of the Board of Trustees, in place of Dr. B. L. Wyman, of Birmingham, according to the custom of the association, which puts the retiring president in the place of the oldest member of the Board of Trustees. Dr. J. Shelton Horseley, of Richmond, Va., was presented with the gold medal for original research in surgery. Memphis was chosen as the next meeting place. New Orleans was well represented at the meeting. The following were in attendance: Drs. Allan Eustis, R. Matas, J. Symth, R. L. De Buys, E. D. Martin, E. Bass, C. C. Bass, E. C. Samuels, W. J. Durel, J. T. Halsey, L. L. Cazenavette, S. K. Simon, J. B. Guthrie, J. A. Danna, T. J. Dimitry and Oscar Dowling.

STARCH AND TABLE SALT SOLD AS NEOSALVARSAN.—A recent indictment of several parties by the Federal Grand Jury in Newark has revealed what is believed to be a widespread conspiracy to defraud the government out of customs revenue by smuggling salvarsan and neosalvarsan into the United States. Further investigation also showed that a majority of the ampoules contained starch, and others stained table salt. The product has been sold in a number of cities. The packages are

very cleverly executed and their outside appearance even led experienced physicians to be deceived.

THE UNITED STATES CIVIL SERVICE COMMISSION will hold two competitive examinations on December 13, 1916, at the various cities of the United States. One of the examinations is to fill the position of dental intern at St. Elizabeth's Hospital, Washington, D. C., and the other is for physician in the Indian and Panama Canal Services. For further information apply for Form 1312, stating the examination desired, United States Civil Service Commission, Washington, D. C.

MISSIONARY HOSPITAL WORK IN INDIA.—A qualified medical man is required who is in sympathy with religious work. Passage paid and small monthly allowance made. Three years' agreement. Apply, sending copies of testimonials, to Commander Eva Booth, Salvation Army Headquarters, 122 West Fourteenth Street, New York City.

PERSONALS.—Dr. Theodore Engelbach, of Grand Isle, La., has been appointed deputy coroner of Jefferson parish, cooperating with Dr. M. Earle Brown, coroner.

Dr. Tom A. Williams, of Washington, D. C., was recently elected corresponding member of the National Academy of Medicine of Rio de Janeiro.

Dr. Charles A. R. Campbell of San Antonio, Texas, delivered a lecture before the Freshmen and Sophomores of the Tulane School of Medicine, on November 2, on the subject of bats and their relation to the extermination of mosquitoes, almost to the extent of eradication of malaria where bat roosts have been erected. Dr. Campbell is a Tulane graduate of the class of 1889.

Dr. J. L. Greene, formerly of the State Hospital for Nervous Diseases in Little Rock, and Dr. M. F. Lautmann, formerly of the Levi Memorial Hospital, Hot Springs, Ark., will now practice medicine together, with offices in the Dugan-Stuart Building, Hot Springs, Ark.

Drs. Maurice J. Gelpi and Hiram Watkins Kostmayer, of New Orleans, have been appointed resident surgeons at the Charity Hospital.

Dr. H. B. Gessner has decided to remain in New Orleans, having changed his plans for a long absence in Germany for Red Cross work.

LAWYER-DOCTOR.—Congratulations are extended Dr. Philip Jones, secretary California State Medical Society, in having successfully passed the Bar Examination and being admitted to practice as an Attorney and Counselor at Law in the State of California.

REMOVALS.—Dr. D. A. Palmisano, from 1300 Canal Street to 402 Medical Building.

Dr. J. Signorelli, from 305 to 402 Medical Building.

Dr. L. S. Charbonnet and Dr. P. B. Salatich, from 801 Audubon Building to 1141 Maison Blanche Building.

Dr. C. A. Wyatt, from New Salem, Route No. 1, to Joachin, Tex.

Dr. Muir Bradburn, Dr. W. P. Bradburn and Dr. P. A. McIlhenny, from 741 Carondelet Street to 3513 Prytania Street.

Dr. W. E. Balsinger has returned from Chicago and resumed his practice in this city at 711 Macheca Building.

Dr. J. A. Bethea, from New Orleans to Army Medical School, Washington, D. C.

MARRIED.—On November 11, 1916, Dr. Lewis H. Levy, of New Orleans, to Miss Jessie Gertrude Burns, of Hattiesburg, Miss.

Dr. James Clifton Cole, of New Orleans, and Miss Betty C. Eastland, of Chicago, on November 30.

DIED.—On November 9, 1916, Dr. J. M. Ledbetter, of Shreveport, La., aged 63 years.

On October 27, 1916, Sister Mary Agnes, for fifty years connected with the Charity Hospital of New Orleans and for forty years superioress of that institution, aged 80 years.

PUBLICATIONS RECEIVED

LEA & FEBIGER. Philadelphia and New York, 1916.

Practical Therapeutics, by Hobart Amory Hare, M. D., B. Sc. Sixteenth edition, enlarged, thoroughly revised, and largely rewritten.

Manual of Chemistry, by W. Simon, Ph.D., M. D., and Daniel Base, Ph.D. Eleventh edition, thoroughly revised.

WILLIAM WOOD & COMPANY. New York, 1916.

The Medical Record Visiting List or Physicians' Diary For 1917.

Physiological Chemistry, by Albert P. Mathews, Ph.D. Second edition.

W. B. SAUNDERS COMPANY. Philadelphia and London, 1916.

The Clinics of John B. Murphy, M. D., at Mercy Hospital, Chicago. Edited by P. G. Skillern, Jr., M. D. October, 1916.

The Medical Clinics of Chicago. September, 1916. Volume 2, No. 2.

THE YEAR BOOK PUBLISHERS. Chicago, 1916.

The Practical Medicine Series. Volume VI: **General Medicine,** edited by Frank Billings, M. S., M. D., assisted by Burrell O. Raulston, A. B., M. D.

WASHINGTON GOVERNMENT PRINTING OFFICE. Washington, D. C.

Fifteenth Annual Report of the Mortality Statistics. (1914). Department of Commerce, Bureau of the Census.

Public Health Reports. Volume 31, Nos. 39, 40, 41, 42, 43 and 44.

The Von Ruck Treatment for Tuberculosis. (Remarks of Hon. Luke Lea, of Tennessee, in the Senate of the United States, September, 1916).

Treatment of Tuberculosis, by Frank J. Clemenger, M. D., and F. C. Martley, M. A., M. D.

The Navy as a Special Field for Medical Work. By the Surgeon General.

MISCELLANEOUS:

Profitable Practice, by George Wood Clapp, D. D. S. (The Dentists' Supply Co., New York).

Adenoids and Tonsils, by Algernon Coolidge, M. D. (Harvard University Press, Cambridge, 1916).

An Adequate Diet, by Percy G. Stiles, Ph. D. (Harvard University Press, Cambridge, 1916).

The Annual Report of the Board of Health or the City of New Jersey. Two hundred and fiftieth anniversary (1666-1916).

Pruning Investigations, by V. R. Gardiner, J. R. Magness and A. F. Yeager. (Oregon Agricultural College Experiment Station, Corvallis, Oregon).

Quarterly Bulletin Louisiana State Board of Health. Vol. VII. (New Orleans, September, 1916).

REPRINTS

Contributions to the Botany of Michigan No. 14, by Oliver Atkins Farwell.

Railway Regulation and Locomotor Ataxia, by Frank Trumbull.

Japanese Medical Literature, by the Staff of the Research Department of the Severance Union Medical College, Seoul Korea.

Anatomia Patologica de las Leishmaniasis Dermicas, por el Dr. Guillermo Almenara.

The Removal of the Troublesome Useless Uterus: Diagnostic Methods in Glenard's Disease Enteroptosie, by A. Ernest Gallant, M. D.

Foreign Bodies in the Rectum, by Llewellin Eliot, M. D.

A History of Bodysnatching, by Frank Baker, M. D.

Herpes Corneae "Febrilis," by Samuel Teobald, M. D.

Longer and More Effective Living, by Eugene L. Fisk, M. D.

Muscle Training in the Treatment of Infantile Paralysis, by Wilhelmine G. Wright.

A Case of Ulcerating Granuloma Successfully Treated by Intravenous Injections of Antimony, by George C. Low, M. A., M. D., and H. B. Newham, M. D., M. R. C. P.

El Paludismo de las Aves en Venezuela, por el Doctor Juan Iturbe.

Cultivo in Vitro del Plasmodium Vivax, por el Doctor Iturbe, Doctor Eudoro Gonzalez.

A Bacillus From Epileptics, by Wm. Barclay Terhune, M. D.

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for October, 1916.

Cause.	White	Colored	Total
Typhoid Fever	10	5	15
Intermittent Fever (Malarial Cachexia)	2	1	3
Smallpox	.....	.....	....
Measles	.....	.....	....
Scarlet Fever	.....	.....	....
Whooping Cough	1	.....	1
Diphtheria and Croup	4	1	5
Influenza	1	2	3
Cholera Nostras	.....	.....	....
Pyemia and Septicemia	.....	.....	....
Tuberculosis	37	52	89
Cancer	19	5	24
Rheumatism and Gout	.....	.....	....
Diabetes	3	.....	3
Alcoholism	.....	.....	..
Encephalitis and Meningitis	3	1	4
Locomotor Ataxia	1	.....	1
Congestion, Hemorrhage and Softening of Brain	29	11	40
Paralysis	3	1	4
Convulsions of Infancy	1	1	2
Other Diseases of Infancy	10	11	21
Tetanus	1	2	3
Other Nervous Diseases	1	.....	1
Heart Diseases	64	36	106
Bronchitis	2	.....	2
Pneumonia and Broncho-Pneumonia	11	9	20
Other Respiratory Diseases	1	2	3
Ulcer of Stomach	.....	2	2
Other Diseases of the Stomach	1	1	2
Diarrhea, Dysentery and Enteritis	19	17	36
Hernia, Intestinal Obstruction	4	1	5
Cirrhosis of Liver	7	3	10
Other Diseases of the Liver	2	1	3
Simple Peritonitis	.....	.....	....
Appendicitis	2	4	6
Bright's Disease	26	17	43
Other Genito-Urinary Diseases	8	13	21
Puerperal Diseases	9	2	11
Senile Debility	1	3	4
Suicide	2	.....	2
Injuries	17	9	26
All Other Causes	27	14	41
Total	329	227	556

Still-born Children—White, 20; colored, 32; total, 52.

Population of City (estimated)—White, 276,000; colored, 102,000; total, 378,000.

Death Rate per 1000 per annum for Month—White, 14.30; colored, 26.7; total, 17.65. Non-residents excluded, 15.30.

METEOROLOGIC SUMMARY. (U. S. Weather Bureau.)

Mean atmospheric pressure 30.03
Mean temperature .....72.
Total precipitation ..... 8.51 inches
Prevailing direction of wind, northeast.